Dental Digest

September 1957

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The Use of RUBBER BASE IMPRESSION MATERIALS *for Dependable Results*

RAY HAILEY, JR., D.D.S., Denver

DIGEST

For the last twenty years restorative dentistry has been limited to a few flexible impression materials; namely, reversible hydrocolloids and alginates. Despite their unstable nature due to a transient high water content, these materials have been a boon to modern dentistry. With the advent of the more stable rubber base materials there is available another material which will supplement, if it does not replace, the hydrocolloids. This article presents an illustrated step-by-step technique for the use of rubber base materials.

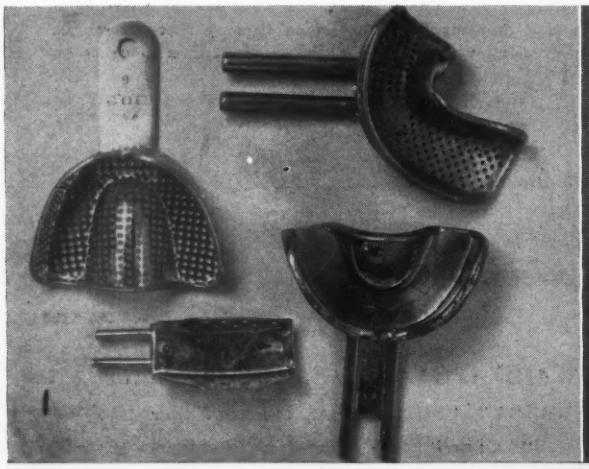
Clinical Advantages of Material

Skinner,[1] Cooper,[2] Hollenbeck,[3] and Sturdevant[4] have demonstrated clinically the degree of accuracy and other advantages of the rubber base materials. (1) The stability against flow and distortion over a long period of time, (2) the ability to reproduce minute details and large undercuts, (3) the meager armamentarium required to handle the materials, and (4) the ease with which some will silver plate, enable these products to open new fields in restorative techniques. It is no longer a question, therefore, whether the materials have the essentials required of a highly reliable impression material. However, like any other adjunct to dentistry, if misused, the results will not be acceptable. Accurate and dependable results may be obtained by exercising care in handling and by following the rules suggested herein.

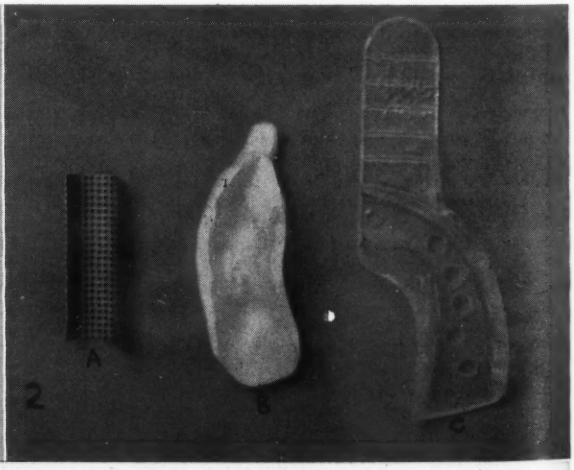
[1]Skinner, Eugene W.: An Evaluation of the New Rubber Impression Materials. Tips on Technique, J. Implant Dent. **1**:39 (May) 1955.
[2]Skinner, Eugene W., and Cooper, E.: Desirable Properties and Use of Rubber Impression Materials, JADA **51**:523-536 (Nov.) 1955.
[3]Hollenbeck, George M.: A Comparison of Flexible Impression Materials, So. Calif. D. J. **25**:20-28 (Jan.) 1957.
[4]Sturdevant, Clifford M.: Impressions for Indirect Inlays, JADA **54**:357-366 (Mar.) 1957.

Impression Tray

Some type of rigid tray or band must be used. The tray should be of stout metal or plastic, in order to eliminate distortion upon insertion or withdrawal. Examples of stock metal trays which may be employed are shown in Figure 1. A perforated tray is not necessary as the use of rubber cement will provide adequate retention of the material to the tray. Some type of disposable tray is advisable because it is difficult to clean the rubber material and cement from any kind of tray for reuse. Stock polystyrene or custom cold cure resin trays are satisfactory. An acceptable tray may also be fashioned from a sheet of heavy gauge metal mesh (Fig. 2). Regardless of the type of tray employed, the use of rubber ce-



1. *Examples of metal trays.*



2. *Examples of throw-away trays: (a) Metal mesh tray. (b) Cold cure resin tray. (c) Stock polystyrene tray.*

ment is imperative in order to obtain maximum retention of the material to the tray.

Tray Liners

The use of modeling compound for stops or as a preliminary impression to line the tray is contraindicated, because the material is incompatible with rubber, producing an incomplete set, and a softening of the compound where the two are in contact. Little or no retention results between the two materials. This would also be the case with the use of wax with permanent distortion of the rubber on withdrawal. Should a tray liner be considered necessary, Pinkerton[5] has suggested the use of ordinary plaster. Since it is quick, dimensionally stable, and compatible with rubber, this is no doubt one of the materials of choice.

Single Impressions

Individual impressions of preparations for crowns, inlays, or bridge abutments may be accomplished with ridgid closed-end copper bands (Fig. 3a). These are available in all sizes such as ordinary copper bands.

2. Heavy gauge open end copper bands with plaster or cold cure resin may be used in one end (Fig. 3, b and c).

3. Regardless of the type of band used, it must be of metal heavy enough so that it cannot be distorted by strong finger pressure. Bands should, therefore, never be annealed.

4. The band must be carefully contoured so that it can be slipped between the gingival tissue and the gingival margin of the preparation and leave at least one millimeter or more of rubber between the band and any part of the preparation (Fig. 4a).

5. Any thin area of rubber between the preparation and tray or band, may be pulled away from the band and permanently distorted, due to the tremendous vacuum created upon withdrawal (Fig. 4, b and c).

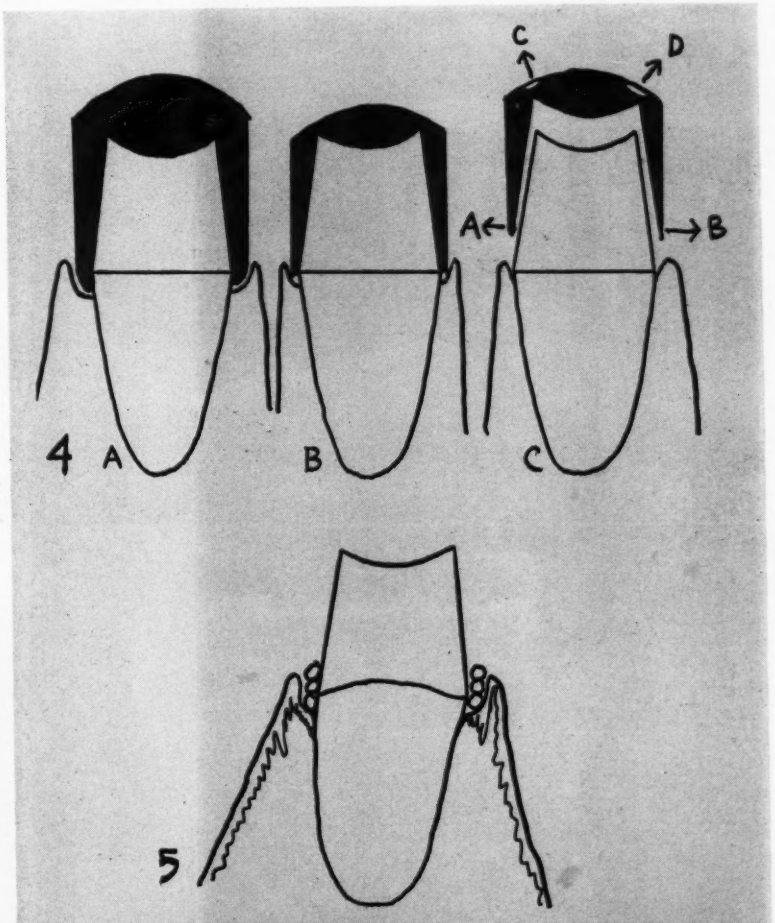
6. Rubber cement is necessary within the band. Perforating and scoring are not enough, but will aid the cement in securing maximum retention. The length of time which the cement requires to dry may be shortened by blowing warm air on it gently.

[5]Pinkerton, Robert G.: Techniques of Rubber Base Impressions: Part One, DENTAL DIGEST 62:394-397 (Sept.) 1956.

3. *(a) 30-gauge closed end copper band. (b) 30-gauge open end copper band.*
(c) 30-gauge open end copper band with cold cure resin in end.

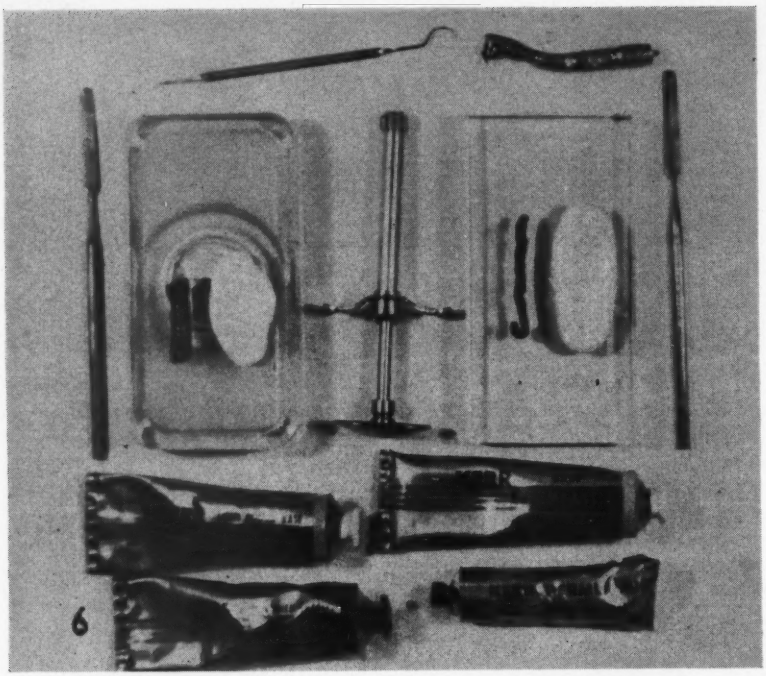
Preparing the Area to Receive the Impression Material

As in the case of the hydrocolloids, the preparations must be completely



4. *(a) Correct size and contour of band. (b) Incorrect, as band is too small to permit proper contour and minimum space for material. (c) Withdrawal of improper fitting band. A and B are probable tear points, C and D are points of distortion, the thin area of rubber may be pulled away from the band due to vacuum created.*

5. *Cross section showing epinephrine string applied in gingival crevice to retract tissue.*

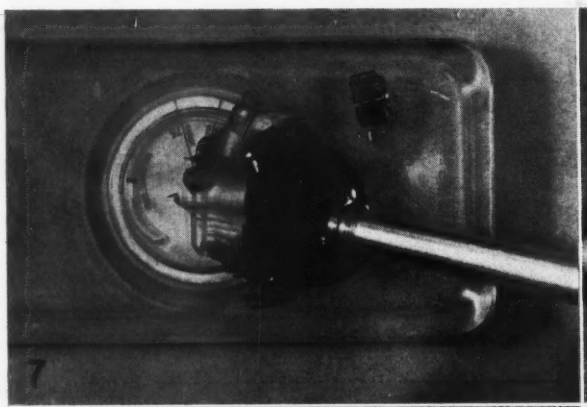


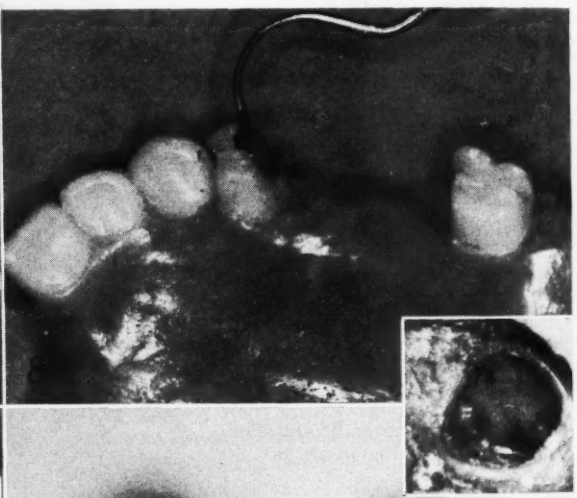
6. *Armamentaria needed to mix and apply rubber material.*

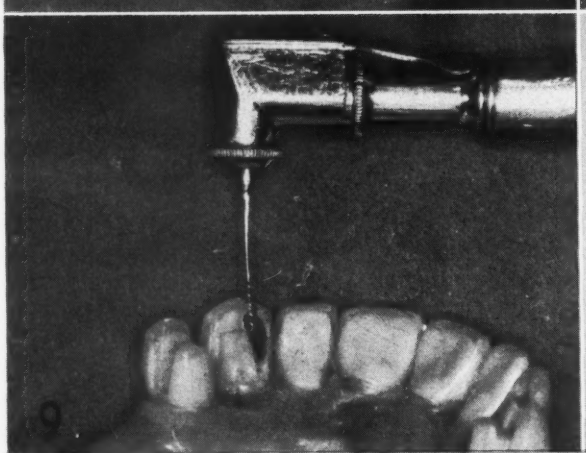
free of saliva, hemorrhage, gingival seepage, and other debris, before and while the material is in the mouth. Two methods are described:

Method One—Wherever possible a rubber dam of heavy thickness should be used as this will provide the best possible solution against the hazards enumerated. The rubber material will not stick to the dam and the dam will act as an excellent gingival retractor.

Method Two—In areas where a rubber dam can not be applied, cotton rolls may be used to keep the region free from saliva, and epinephrine string, which is now commercially available, may be used to retract the gingival tissue. Two or three







7. *Aspirating thin mix into rubber type syringe.*
8. *Thin material being carried into small groove by explorer.*
9. *Material carried into pin hole with root canal spiral.*

10. *Full mouth rubber impression result, involving both pinlays and inlays. Figure in corner is enlarged view of pinlays.*

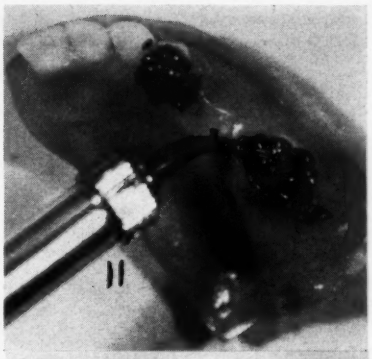
layers of string should be wound around each individual tooth, pressed into the crevice and allowed to remain for five to ten minutes (Fig. 5), so that upon removal the free margin of the gum will stand away from the gingival margin of the preparation. In many instances the lower string may be left in while taking the impression, to prevent hemorrhage which is difficult to control. In areas where there is profuse hemorrhage, Negatan® may be applied to the string with a cotton pellet.

Distal of Second Molar—Where the tissue is tough and hard to pack back, as in the distal aspect of the second molars, a cotton string of larger diameter may be made by rolling cotton fibers by hand, inserting them, and applying Negatan or 8 per cent racemic epinephrine HCL by cotton pellets. Both the Negatan and 8 per cent racemic epinephrine HCL may be obtained commercially.

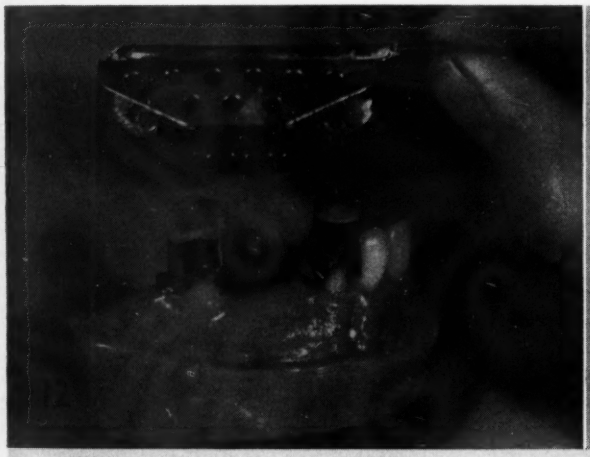
Choice of Rubber Material

The choice of material to be used is one of personal perference. There are many excellent ones on the market, and having tried most of them, the author has found little difference clinically between them in regard to their accuracy.

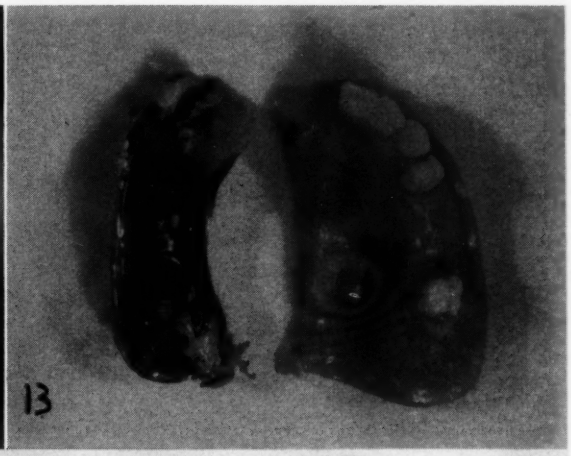
Two Types of Mixes Indicated—It is necessary to use materials which allow two consistencies of mixes; one which is thin and slow setting and the other having a heavy body and a quick set. The thin, slow setting mix is for painting the teeth by syringe or instrument. The heavy bodied mix is used in the tray or band which acts



11. *Syringe used to finish painting procedure.*

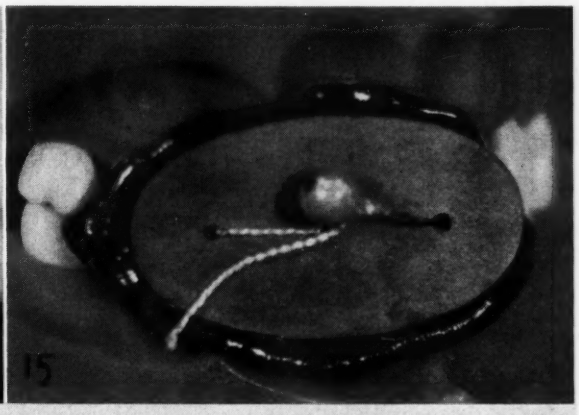


12. *Oversized tray used to pick up copper band impression. Tray should be filled with heavy bodied mix.*

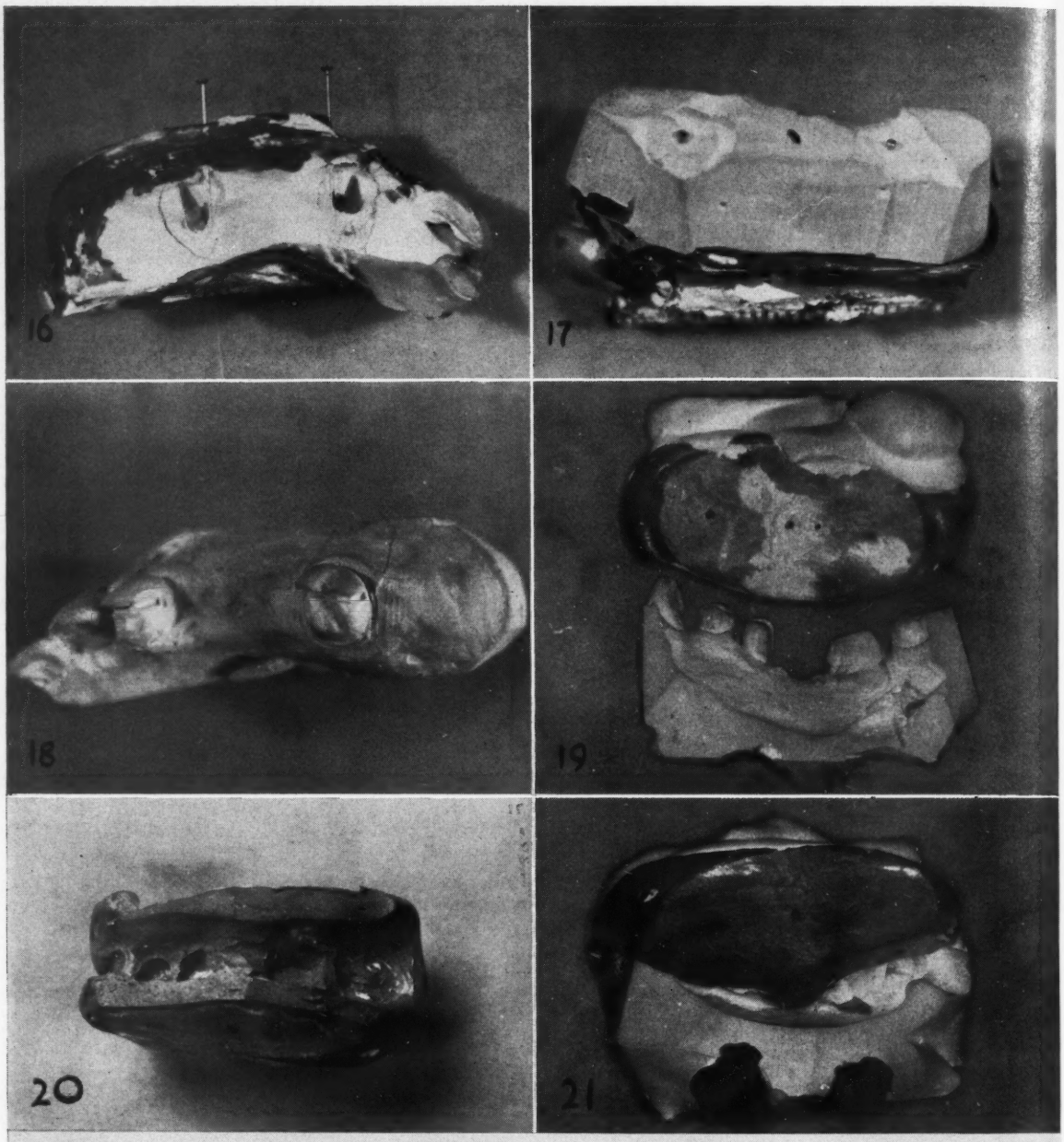


13. *Rubber impression, the light material is the tray mix, the dark the painting mix.*

14. *Rubber material Neoplex used for bite.*



15. *Bite being taken.*



16. *Dowel pour of model. Areas A and A should be covered with separating medium.*
17. *Model with dowel ends showing.*
18. *Occlusal view of model.*
19. *Opposing model poured in bite with working model ready to insert.*
20. *Working model side of bite. Borders cut down with scissors.*
21. *Working model in place on bite and carding wax over dowel ends.*

as a plunger to drive the thin material ahead of it to prevent the trapping of air.

Available Materials — There are products on the market which have two different tubes of material, an injection type and a regular or tray type, plus a tube of accelerator for each. Other materials have only one basic material along with an accelerator. This type may be made into two mixes by using less accelerator for a thin mix and more accelerator for a heavy bodied mix. The chilling or warming of the slab will help to control the working time of a mix. Chilling increases the working time while warming hastens the set. A metal or glass slab will allow chilling or heating to vary the setting time.

Procedure for Taking the Impression

1. Two slabs and spatulas must be used (Fig. 6). Place upon one slab which is chilled to about 65 degrees, small amounts of base and accelera-

tor, in proportions according to the manufacturer's directions. This is to be used for the painting mix.

2. On the room temperature slab, place amounts of base and accelerator to obtain a thick mix. The amount should generously fill the tray or band.

3. The assistant should begin mixing the thin material first. The accelerator should be picked up and incorporated into the base and thoroughly mixed so there are no streaks present upon completing the mix. This should take about thirty seconds.

4. Using a rubber type syringe the mix may be aspirated into the barrel by removing the plastic tip (Fig. 7). Reapply the plastic tip and hand to the operator.

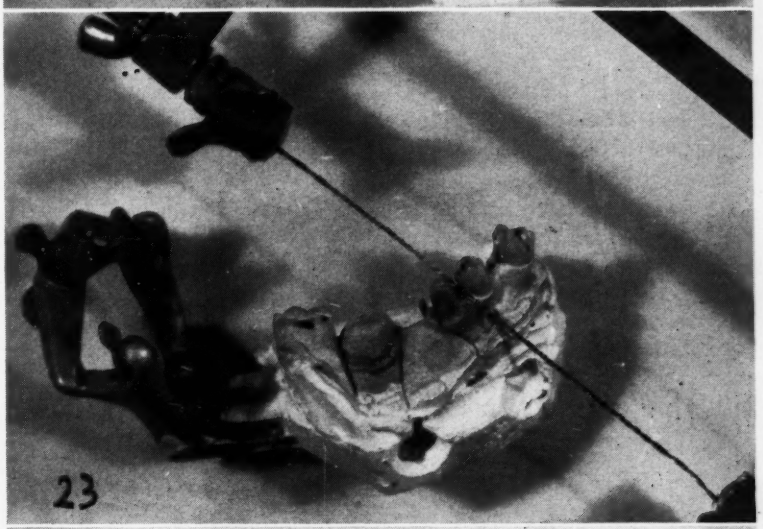
5. While he is painting the teeth with this material the assistant may be mixing the tray material. She should fill the tray or band and have it ready for the operator to insert immediately after thoroughly painting the teeth.

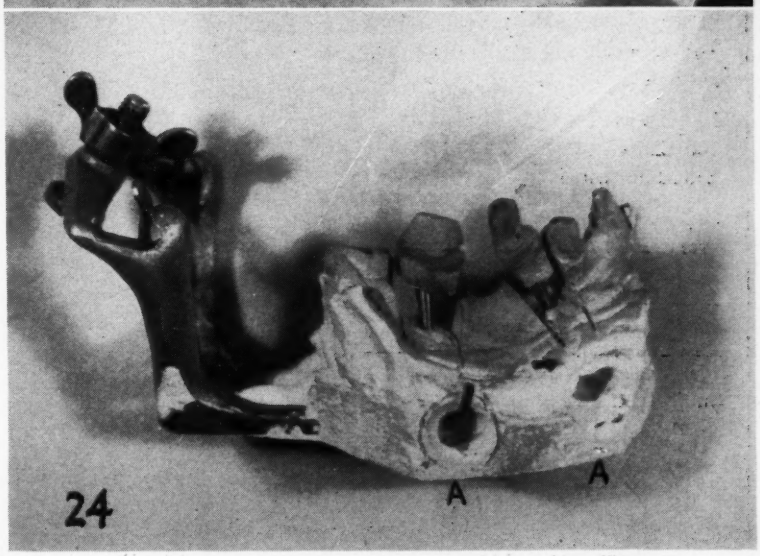
6. To paint the teeth an explorer should first be used to carry the material into any small grooves present. This will help to prevent the trapping of air in these small areas. of the preparation (Fig. 8).

7. If pinholes are present, a motor-driven root canal reverse spiral should be used to carry the material into the holes (Figs. 9, and 10). The syringe should be used to finish the painting procedure (Fig. 11).

8. The tray filled with the heavy bodied material may now be carried to place.

9. The tray should be steadied by the hand for two or three minutes and then released. A minimum of at least ten minutes is required for curing. In order to be sure the painted material is set before removal, a small amount should be placed on teeth that are not included in the impression. When a sharp instrument will not leave an indentation in this





22. ***Practical case mounted.***
23. ***Sectioning dies.***
24. ***Holes A and A made by removal of carding wax from dowel ends.***

material, the impression is ready to remove. Withdrawal before making this check may cause distortion.

10. The impression may be poured at any time within the next several hours. (Fig. 12).

11. One or more bands may be picked up in a single impression using rubber in an oversized tray (Fig. 13). In this case rubber cement must be used on the outside as well as inside the bands. This technique should not be used on approximating teeth as there is seldom room enough for the bands.

Method for Taking Bite

In cases where a unilateral bite is desired, an extremely accurate one may be obtained with Neoplex. This rubber material, when correctly mixed, has a consistency of dough and will not stick to the hands. The following steps may be taken:

1. Using a Bite-Right, fill entirely with material (Fig. 14). Place in the mouth and have the patient close in centric (Fig. 15).

2. Pull drawstring and leave until rubber is thoroughly set. Then remove.

Constructing Working Model

1. A hard die stone should be used and a sectional model made, using dowel pins.

2. Pour abutments and edentulous areas between with hard die stone. This, including the teeth and base, should be approximately one-half inch thick. A thinner model on this pour may not give consistent setting expansion throughout.

3. Place dowels in abutments. If the mix is thin, straight pins may be used to hold dowels upright; a thick mix is preferable, however, and in this case the dowels will maintain their position without support of pins (Fig. 16).

4. On complete set of the dowel pour, paint separating medium only in the area of the dowels (Fig. 16a).

5. Pour base of hard stone, leaving ends of dowels exposed (Fig. 17).

Model May be Reproduced—Figure 18 shows the occlusal view of the poured model. Should an unsatisfactory model be produced first, another may be made, giving the same accurate reproduction as the first pour. The author has made as many as six reproductions all of which produced satisfactory results.

Alternate Method—A better working model may be obtained by silver plating the impression. This may be done easily and accurately with the silver plating equipment now on the market. By following the simple directions accompanying the machine excellent results may be obtained.

Mounting the Case

1. Pour the opposer of the rubber bite in hard stone (Fig. 19).

2. Before inserting the working model into the bite, trim the rubber borders with scissors to ensure an accurate seat (Fig. 20).

3. Place carding wax over ends of dowels and over to buccal edge of model (Fig. 21).

4. Mount the case with plaster on a small crown and bridge articulator (Fig. 22).

5. Using a gold saw, section the working model for dies (Fig. 23).

6. Remove carding wax from ends of dowels leaving holes A and A (Fig. 24). These holes provide entrance to dowel ends which may be pushed against for removal of dies.

1325 *East 16th Avenue*

CLINICAL AND LABORATORY SUGGESTIONS

(*See pages* 416 *and* 417)

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Oral Surgery Complications Caused by FLIGHT*

MAJOR LUCIAN SZMYD, USAF (DC) Randolph Air Force Base, Texas

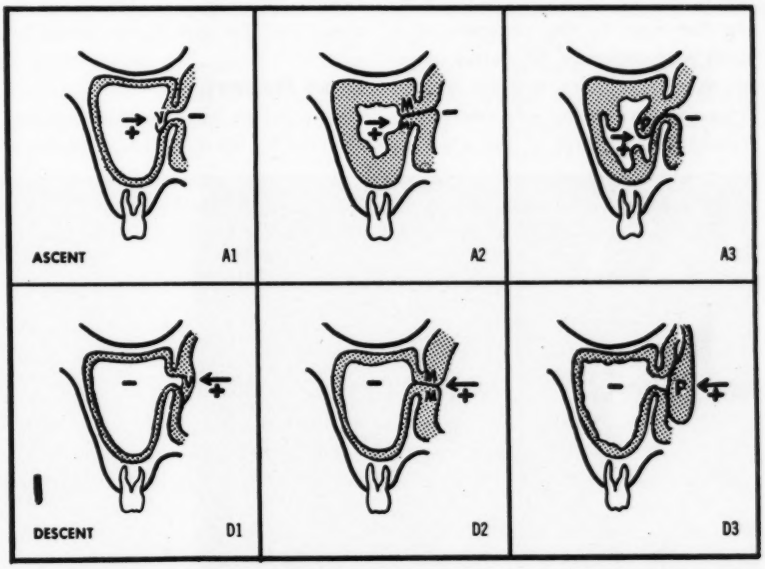
DIGEST

The extraction of posterior maxillary teeth often necessitates the removal of considerable alveolar bone. Large areas of antral membrane thus may be deprived of bony support. This article discusses some of the physical factors encountered during flight which may affect the postoperative course of such cases. The case reported demonstrates the effect of changes in atmospheric pressure, created during flight, on the Schneiderian membrane of an abnormal sinus following the surgical extraction of maxillary posterior teeth.

Factors Affecting Equilization of Pressure

When the maxillary sinus is subjected to variation in barometric pressure during flight, equilibrium between the pressure within the cavity and atmospheric pressure is established at a rate that depends upon the size of the ostium and the extent of change in barometric pressure.[1] The extent of change in atmospheric pressure depends upon the altitude and the rate of vertical ascent or descent.[2] When the maxillary sinus is normal and the ostium is patent, differences in pressure between the air within the sinus cavity and the surrounding atmosphere are brought into equilibrium quickly and uneventfully.[3] Obstruction of the ostium by redundant or hypertrophied tissue, anatomic deformities, polyps, mucus, or purulent exudate may delay or prevent equilization of pressure[4] (Fig. 1).

Atmospheric Pressure Changes Created by Flight—(1) Operational aircraft fly at altitudes over 40,000 feet and are capable of vertical ascent at rates of 100 feet per second and dive at speeds of 1,000 feet per second. (2) Operational aircraft flying at altitudes exceeding 40,000 feet maintain their cabin pressure at approximately 16,000 to 20,000 feet. (3) Conventional transport aircraft fly at altitudes of 6,000 to 10,000 feet and ascend and descend at rates approximating ten feet per second. (4) Commercial transport aircraft flying at altitudes exceeding 10,000 feet maintain their cabin pressure at approximately 6,000 to 10,000 feet.[5]



1. ***During ascent (A) any valvular formation within the sinus cavity will prevent the exit of air from the sinus as the atmospheric pressure decreases. During descent (D) and increase of atmospheric pressure similar formations on the nasal side of the ostium will prevent the entrance of air into the sinus.***

A. Ascent

A1. V—Developmental flap-valve formation of sinus mucous membrane..

A2. M—Swelling of the mucosa of sinus with flutter-valve effects.

A3. P—Mucosal polypus in sinus constituting a ball valve.

D. Descent.

D1. V—Developmental flap-valve formation of nasal mucosa.

D2. M—Swelling of nasal mucous membrane with flutter-valve effects.

D3. P—Polypus presenting in nasal fossa and acting as a ball valve.

*From School of Aviation Medicine, U. S. Air Force, Randolph Air Force Base, Texas.

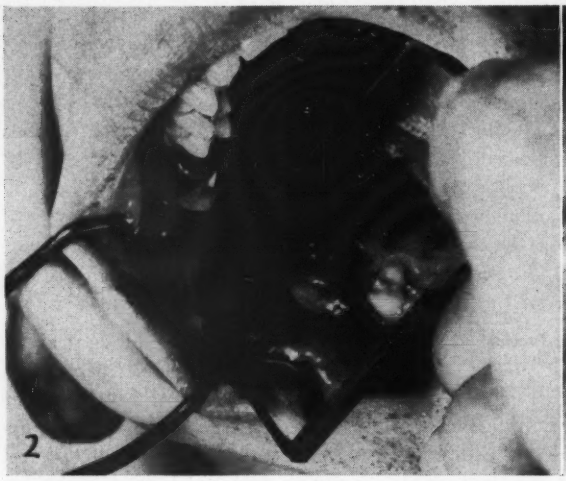
[1]Campbell, P. A.: Aerosinusitis—résumé. Tr. Am. Laryng. A. **66**:65-86, 1944; also Ann. Otol. Rhin. & Laryng. **54**:69-83 (Mar.) 1945.

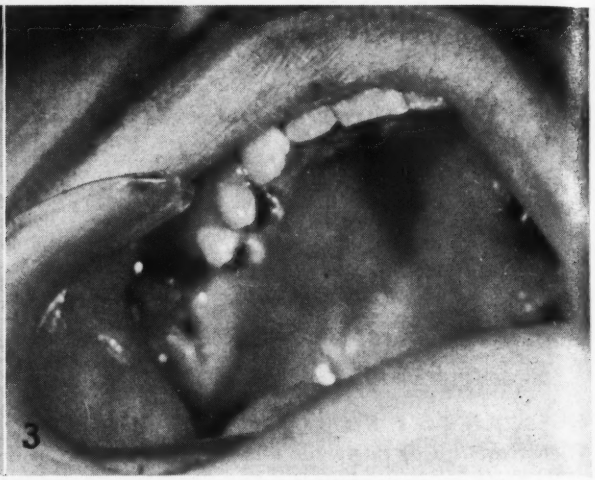
[2]Armstrong. H. G.: Principles and Practice of Aviation Medicine, Ed. 3, Baltimore, The Williams and Wilkins Company, 1952, pp. 333-335.

[3]McFarland, R. A.: Human Factors in Air Transportation, New York, McGraw-Hill Book Company, Inc., 1953, pp. 681-682.

[4]Dept. of the Air Force: Flight Surgeon's Manual, AFM **160**-5 (July) 1954.

[5]Dept. of the Air Force: Physiology of Flight, AFM **160**:30 (July) 1953, pp. 51-56. (Reproduced from "Contributions to Aviation Otolaryngology," by E. D. D. Dickson, Headley Brothers, London, 1947).





2. ***Photograph showing the herniated antral membrane in the right molar area following flight. (Mirror image shows the palatal view.)***

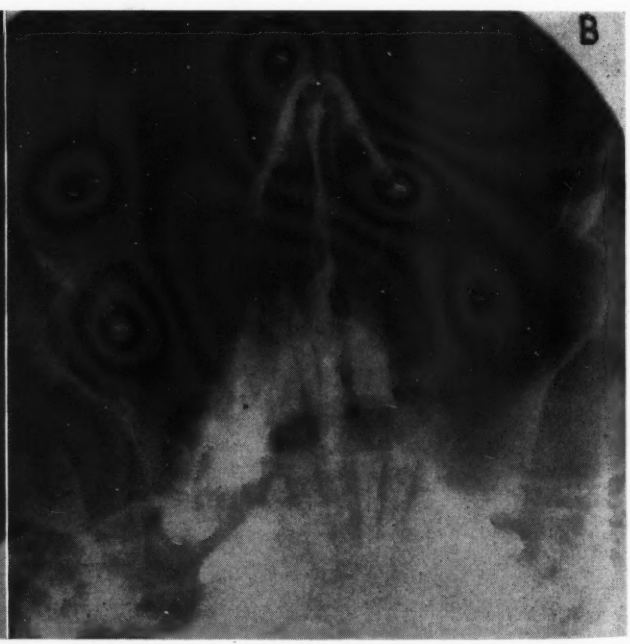
3. ***Photograph showing the oroantral fistula.***

Caution against Sneezing—Whenever the antral membrane is exposed or perforated in an oral surgical procedure, the patient is always cautioned against sneezing or blowing of the nose because these acts affect the pressure in the maxillary sinus. This can readily be demonstrated by blowing the nose in the presence of a small perforation of the antral membrane. Air bubbles will be emitted from the perforation site due to the increase in pressure of the gases in the antrum.

Air Travel Prohibited—The following case illustrates that when the Schneiderian membrane of an abnormal sinus is exposed or perforated following a surgical procedure, the patient should be cautioned not only against sneezing and blowing of the nose, but also against air travel.

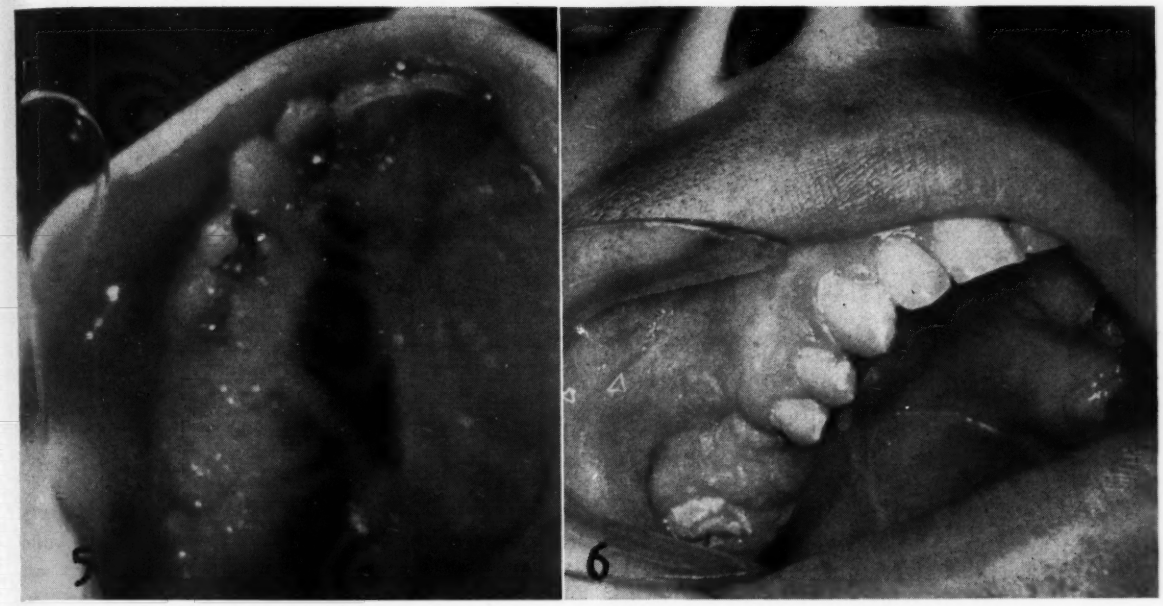
Case Report

History—A 23-year-old airman was referred by the ear, nose, and throat department to the oral surgery service with a large oroantral fistula. Six weeks prior to admission, the right maxillary first and second molars were extracted. The patient stated that considerable alveolar bone had been removed in order to perform the extractions and that he was cautioned against blowing his nose or sneezing afterward. Healing was uneventful until the patient took an airplane flight one week after the operation. After landing, the patient noted



4A. ***Waters view taken preoperatively showing the cloudy right antrum.***

4B. ***Waters view taken four months postoperatively, showing clearing of right antrum.***



5. ***Photograph taken two weeks postoperatively showing the flap over the right maxillary molar area and the denuded area on the palate.***

6. ***Photograph taken four months postoperatively, showing the successful plastic closure of the oroantral fistula.***

a large mass protruding into his mouth at the extraction site (Fig. 2). A diagnosis of a herniated antral membrane was made and the tissue was excised. The patient was then referred to the oral surgery service for treatment.

Clinical Examination—(1) An oroantral opening one centimeter in diameter was revealed in the area of previous extractions (Fig. 3). (2) A probe passed readily through the opening into the right maxillary sinus. (3) A large polyp was obstructing the opening, but no evidence of drainage from the maxillary sinus was noted. (4) No lymphadenopathy or asymmetry of the face was seen on admission. (5) Roentgenographic examination revealed a generalized opacity of the right antrum (Fig. 4a).

Condition Prior to Air Travel—From clinical and roentgenographic evidence it appeared that three conditions had existed prior to air travel: (1) infection of the maxillary sinus, (2) lack of bony support for the antral membrane in the area of the herniation, and (3) a defect in the integrity of the oral mucous membrane in the area of the herniation.

Treatment Procedure—1. Using general anesthesia an orthodox Caldwell-Luc approach was used to enter the right maxillary sinus.

2. After the removal of polyps and purulent exudate, a nasoantral window was made.

3. The antrum was then packed with iodoform Vaseline® gauze.

4. The end of the pack was passed into the nasal cavity, and the original incision was closed without drainage.

5. After de-epithelization of the fistulous tract, a subperiosteal palatal flap containing the anterior palatine artery was provided to close the oroantral fistula (Fig. 5).

6. A surgical acrylic splint, which had been constructed prior to surgery, was adjusted and inserted.

Postoperative Course Uneventful—The denuded area on the palate was completely epithelized and a satisfactory closure of the oroantral fistula was obtained (Fig. 6). Roentgenographic examination, four months postoperatively, revealed that the right antrum had cleared (Fig. 4B).

Summary and Conclusions

Changes in atmospheric pressure created during flight may produce undue stress on the antral membrane of an abnormal sinus when it is devoid of bony support.

The oral surgeon must be aware of the physical factors encountered during flight which may adversely affect the postoperative course in patients from whom considerable alveolar bone is removed during the extraction of posterior maxillary teeth. In cases where alveolar bone is lost in the vicinity of the antrum, the oral surgeon should obtain roentgenograms to evaluate the sinus. Whenever infection or other abnormalities are noted, treatment should be recommended and the patients advised against air travel.

The wisdom of this course is illustrated by a case report which describes the herniation of an antral membrane at the site of a defect in the alveolar bone produced during dental extractions. Infection of the maxillary sinus existed prior to the herniation. If the patient had been warned to avoid air travel the herniation probably would not have occurred.

Adapted from *United States Armed Forces Medical Journal* **8**:264 (Feb.) 1957.

ALUMINUM CROWN *to* ACRYLIC CROWN

J. WILLIAM HUGHES, D.D.S., Miami

DIGEST

This article describes a technique for the use of preformed anatomic aluminum crowns in making temporary acrylic crowns for teeth that are to receive veneer crowns. The steps in the procedure outlined are illustrated.

Procedure

The following procedure is completed:

1. Remove caries and old restorations, if present (Fig. 1). Place sedative base in the deep areas of the cavity (Fig. 2). Reduce the tooth contours on the occlusal, buccal, and lingual where necessary.

2. Trim and fit an oversize Parkell's precarved anatomic aluminum crown to correct occlusion, contact, and length.

3. Cement the aluminum crown on the tooth or teeth with a hard posterior filling material. Petralite or Oxsilit may be used (Figs. 3 and 3A). While it is setting, take an alginate impression of the mouth; rinse impression, blow out with air, and set aside for use at step five.

4. Split the crown with a disc or sharp instrument and peel the crown off the tooth (Fig. 4). Discard the aluminum crown. The tooth is now reshaped, and built up with Petralite, and is ready for crown preparation. Treat the built-up portions in Petralite as tooth structures, and prepare the tooth in the usual manner. Complete as much as possible at the gingival.

5. Mix proper shade of fast cure acrylic and liquid, (Acralite Fast Crown is recommended) and place acrylic in the impression of the tooth to be crowned. Return the impression to the mouth. When set, remove impression and crown, trim excess, and polish crown, if necessary.

6. Place the crown on the tooth with a mix of sedative temporary cement, and wisps of cotton for easier removal later (Fig. 5). Ward's surgical cement and clear liquid may be used, or zinc oxide and eugenol. If the crown is too tight, the inside can be enlarged with stones. Leave bulk at the gingival. The over-size fit of crown at the neck is excellent to pack the tissue away from the margins before the final impression is taken (Fig. 6).

Advantages

1. The aluminum crowns are inexpensive, come in many sizes, are easy to fit, and are discarded on the first visit.

2. With hand mirror, show the patient the aluminum crown in place. He will be pleased when he sees the temporary acrylic crown. This stimulates interest and desire for the additional restorations.

3. The use of the aluminum crown affords an easy, simple way to build up broken down teeth to form and shape. The pulp is protected, the carious areas are removed and filled in, undercuts removed, weak walls strengthened, and tooth structure saved. All these factors make the final preparation and impression much easier, faster, and more accurate.

4. Good temporary anatomic form, occlusion, and contact are easily established. Cheek biting is eliminated. Esthetics are excellent.

5. The acrylic crowns can be worn indefinitely, are easy to remove, clean, and reset, and give excellent protection to tooth and tissue.

6. Because of its bulk at gingival and over-extension, the acrylic crown will form a trough at gingival to push tissue away. It is an excellent means in conjunction with periodontal procedures as an aid in holding packs in position.

7. Labortory time and expense are saved, as one or multiple scattered teeth can be done at the same time. The crowns can be made on the study models before the patient's appointment by varying the procedure. It is an excellent aid in presentation or explanation to the patient as to what and how treatment is to be accomplished.

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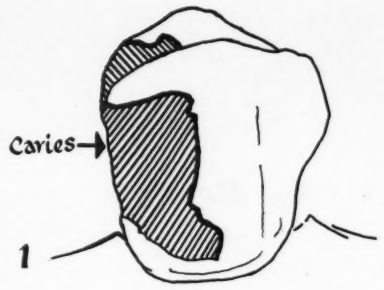
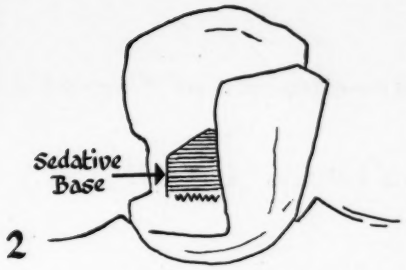
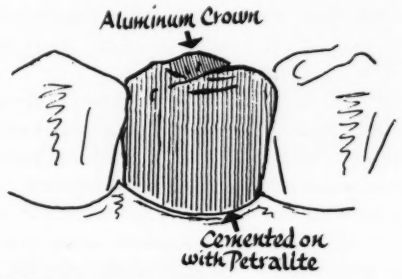
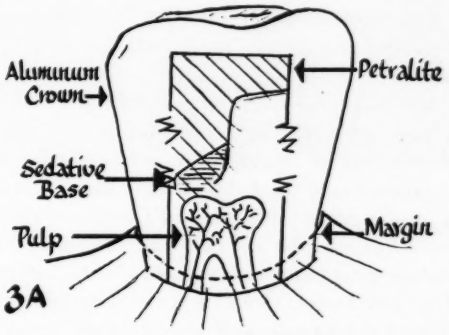
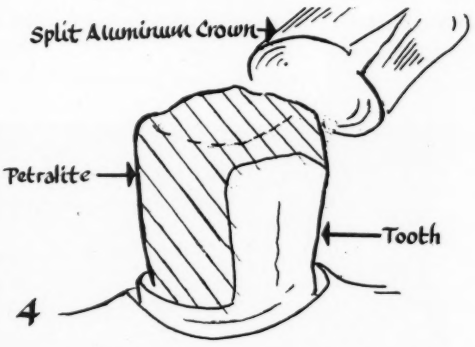
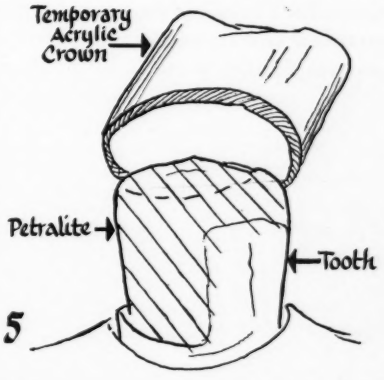












1. *Carious, weak, unsightly bicuspid.*

2. *Caries removed, pulp protected, contours reduced.*

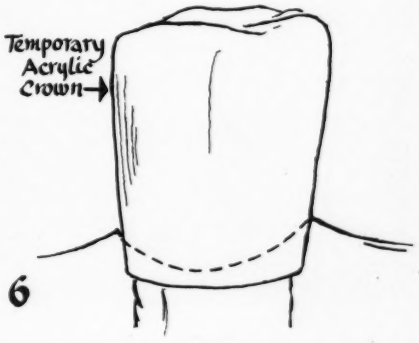
3. *Aluminum crown cemented on the tooth.*

3A. *Aluminum crown cemented on the tooth (cross-section).*

4. *Aluminum crown split and removed. Proceed with the preparation.*

5. *Tooth prepared, temporary acrylic crown completed and adjusted. (Note bulk at gingival.)*

6. *Acrylic crown cemented on with temporary sedative cement. (Note overextension at gingival.)*



The Treatment of Complicated

MULTIPLE FACE FRACTURES: *A Case Report*

MARVIN E. PIZER, D.D.S., M.S., Alexandria, Virginia

DIGEST

This case report describes the step-by-step procedure used in the treatment of a patient whose head and face were severely injured in an automobile accident. Injuries included multiple fractures, lacerations, and bleeding which endangered the patient's airway. Photographs of the patient when first seen and of the results accomplished after months of treatment and many surgical measures are presented. The step-by-step surgical corrective procedures which resulted in excellent functional and cosmetic conditions are amply illustrated.

History

A 20-year-old white male was involved in an automobile accident on January 25, 1955. He was admitted to the United States Army Hospital at Fort Knox, Kentucky on this date.

Results of Examination—Initial clinical and radiographic examination of the facial bones revealed the following condition:

1. Multiple fractures of both maxillae, right and left zygomatic bones, right infraorbital and supraorbital rims, and the two zygomatic arches.

2. There was also clinical evidence of a compound fracture near the symphysis of the mandible. Bilateral condylar fractures were also sustained.

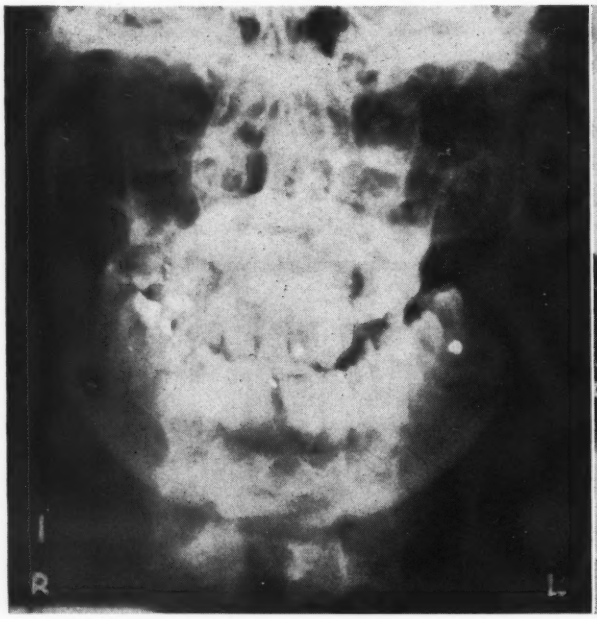
3. Most of the posterior teeth were fractured as well as the tuberosity regions of both maxillae. The shattered maxillary teeth were to a great extent pushed into the maxillary sinuses.

4. A laceration of the right external auditory canal was probably secondary to the fractured condyle.

5. Roentgenograms of the facial bones revealed the following:

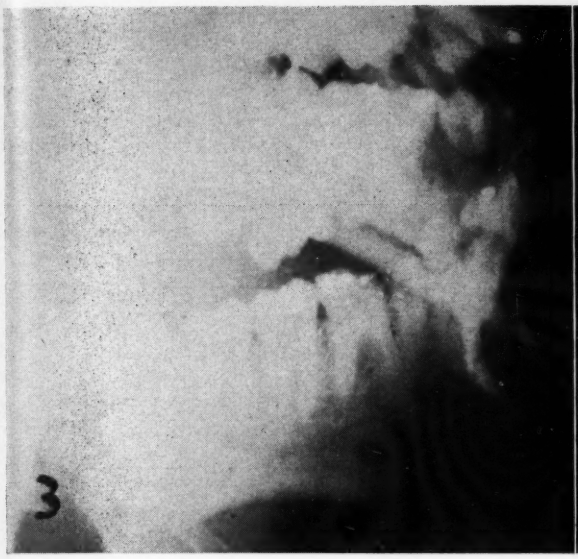
Transverse comminuted fractures through both maxillae, which explained the clinical picture of the floating maxillae. The other clinical findings were confirmed (Figs. 1, 2, 3, 4, 5, and 6).

6. The face and front of the neck were massively edematous and ecchymotic (Figs. 7, and 8). The swelling was most pronounced in the re-

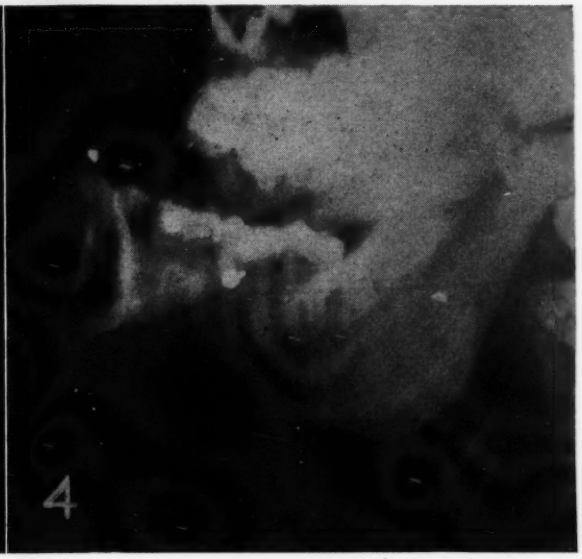


1. *View taken January 26, 1955 reveals fragments of amalgam and shattered maxillary molars. Note the transverse fracture on the left side near symphysis of the mandible.*

2. *Modified Waters view taken January 26, 1955 illustrates the fractures of the maxilla and zygomatic bones.*



3. *Right lateral jaw film taken January 26, 1955 shows the fractured symphysis.*



4. *Left lateral jaw film taken January 26, 1955 reveals fracture of left condyle.*

5. *Note bilateral dislocation of condyles. Film taken January 26, 1955.*

gions of the right parotid and mandibular areas.

7. There was a laceration of the chin.

8. Moderate bleeding from the facial fractures into the oropharynx put the patient's airway in a precarious condition.

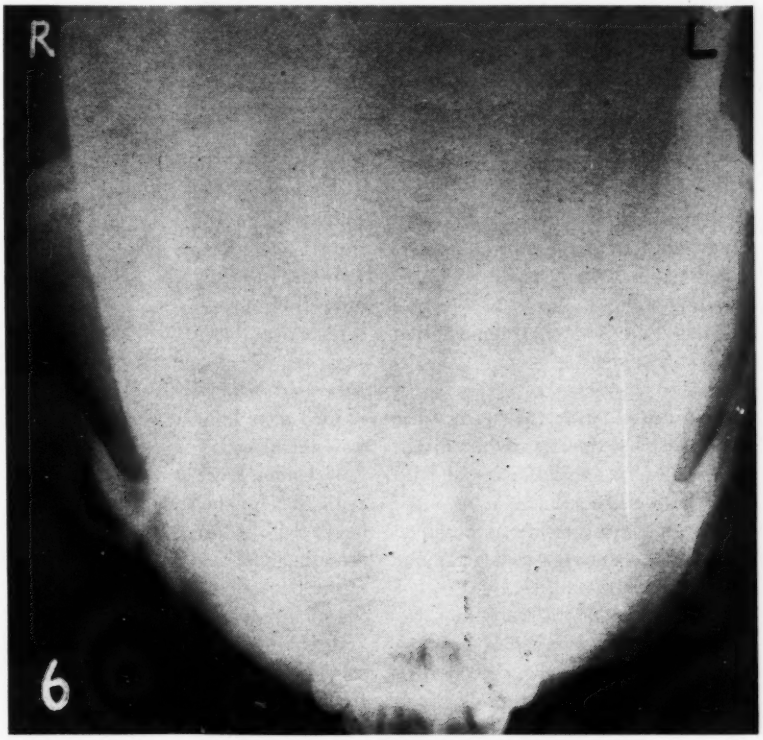
General Condition—No other injuries were sustained by the patient who could not talk, but could answer questions with a negative or affirmative nod. Blood and urine studies were essentially normal.

Emergency Treatment—On the day of admission a member of the Surgical Service performed a tracheotomy under local anesthesia to avoid possible respiratory embarrassment. The patient was put on penicillin and streptomycin and administered 5 per cent dextrose in water intravenously.

First Surgical Procedure

The following procedure was performed under general anesthesia:

1. The maxillary right and left first,



6. *Preoperative position of right and left zygomatic arches. Note the depressed fracture of the left arch on the temporal side. Film taken February 3, 1955.*

7. *Photograph of patient taken January 26, 1955. Note the tracheotomy apparatus in position. The chin lacerations have been repaired.*

8. *Photograph also taken January 26, 1955, illustrates the facial edema, ecchymosis, and lacerations*

second and third molars, the mandibular right and left second premolars, and first molars were all surgically removed. The removal of the maxillary teeth was complicated by the fact that the floor and anterior walls of the maxillary sinuses were comminuted, therefore, even when carefully sectioning the teeth, the surrounding bony structures were loosened and greater fragmentation of bone resulted.

2. The fragments of bone which were removed with the teeth were separated from the teeth with chisels, then soaked in normal saline and inserted into the maxillae in as close an anatomic relationship as possible. This built an anterior wall and floor for the maxillary sinuses.

3. After the floors were in satisfactory position, a layer of gelfoam was placed beneath the mucoperiosteum, and the oral wound closed tightly with 000 interrupted silk sutures.

4. With the use of a nasal rasp, a nasal-antral window was produced through the inferior meatus on the right and left sides. The sinuses were packed with ½-inch gauze to maintain the bony fragments of the right and left antrum in position. The patient tolerated surgery and was returned to his ward.

He was returned to antibiotic therapy and postoperative progress was satisfactory.

Second Surgical Procedure

Two days later a second operation was performed:

1. Under local anesthesia an open reduction for the fractured symphysis began with a 5-inch skin incision, in the submental region, about one centimeter beneath the inferior border of the mandible.

2. Upon exposure of the fractures, some soft tissue was visualized in the fracture line. This tissue was removed and the fragments curetted to stimulate bleeding.

3. Two fenestrations were placed in each of the fragments as close to the inferior border of the mandible as feasible.

4. Twenty-four gauge stainless steel wires were applied diagonally across the fracture, and with the fragments in good position these wires were tightened. One of the diagonal wires was of double thickness.

5. A portion of the lingual cortex in the region of the symphysis was still seen to be displaced from an incomplete transverse fracture. This fragment was tucked under the transosseous wires and held firmly.

6. The wound was closed in layers and a Penrose drain inserted. The usual pressure dressing was applied to the skin. Wire ligatures were applied about the mandibular anterior teeth for additional stabilization. The patient sustained surgery satisfactorily.

Sutures Removed — Three days later the intraoral sutures from the right and left tuberosity regions were removed. Healing of the oral tissues

was satisfactory except for a small area in the region of the maxillary right first molar. Here there was some purulent exudate. On this date there was a semisanguineous exudate from the submental incision.

Occurrence of Facial Palsy—In three days the facial edema subsided significantly. It was now apparent that the patient had injured the right facial nerve and a complete facial palsy of the right face had resulted. There was also a Third Nerve palsy on the right side producing a fixed and dilated pupil. No diplopia or loss of vision was sustained.

Third Surgical Procedure

The next day a third facial operation was performed under general anesthesia. The following steps were taken:

1. Arch bars were attached to the remaining maxillary and mandibular teeth.

2. An open reduction of the left zygomatic arch was performed, approaching the depressed arch from a 2-inch incision of the skin parallel to and just above the hairline.

3. By blunt dissection to the temporal fascia, and then down to the zygomatic arch, the depressed fracture was easily reduced with a malar elevator. The wound was closed in layers.

4. One-inch skin incisions were made through the eyebrows over the right and left supraorbital ridges.

5. With the bone exposed, holes were drilled through these rims.

6. Double thickness 25-gauge stainless steel wires were passed through these fenestrations, attached to a silver malleable probe, which guided the wires posterior and medial to the zygomas and into the mucobuccal fold of the mouth in the maxillary bicuspid regions.

7. After establishing a vertical dimension and occlusal relationship, the wires from the supraorbital rims were ligated about the mandibular arch bar in the region of the first molars.

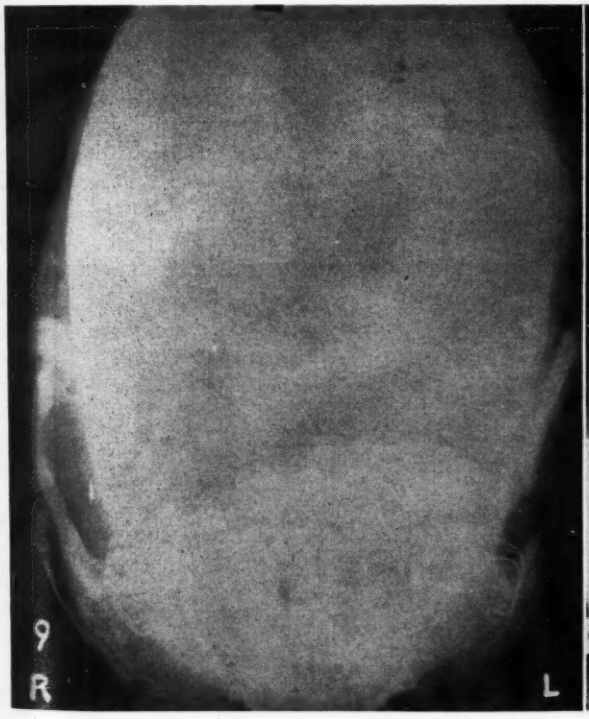
8. The same wires were ligated around the mandibular second molars.

9. Intermaxillary traction with the use of elastics between the maxillary and mandibular arch bars was also utilized to supplement the suspensory traction. The patient was redraped, and the supraorbital wounds were closed in the usual fashion. The patient withstood the procedure well and was returned to his ward (Figs. 9, and 10).

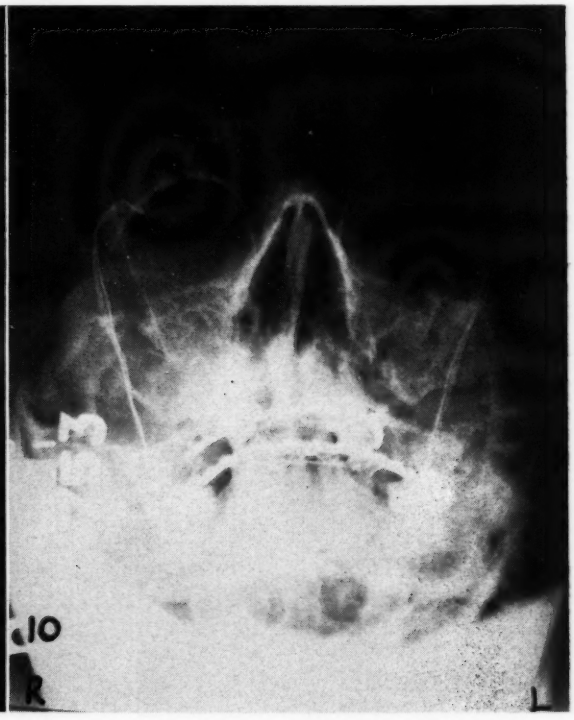
10. The following day the packing in the maxillary sinuses was removed through the nasal-antral windows.

Wound Opens Spontaneously—the submental wound opened spontaneously, extraorally, and a large amount of suppurative exudate was expressed. A Penrose drain was inserted. A smear for culture and sensitivity studies was taken, and the patient placed on Terramycin® therapy.

A week later the gingival tissues, buccal to the mandibular central and lateral incisors began to recede, leaving exposed alveolus. Vaseline® gauze dressings were placed over the ex-



9. *Postoperative view of zygomatic arch. The left arch is in good position. Note the suspension wires from the supraorbital rims as they pass medial to the zygomatic arches. Film taken February 9, 1955.*



10. *Note suspensory wires passing from supraorbital rims to the mandibular arch bars and second molars. Also note transosseous wire stabilizing symphysis.*

posed bone. There was still some purulent drainage from the skin side of the submental wound. This was irrigated daily with hydrogen peroxide. The patient was now put on Chloromycetin®, which was found to be the antibiotic of choice, as a result of sensitivity studies.

Facial Nerve Injury Studied—The patient was referred to the Physical Therapy Department four days later for myographic studies to determine the extent of facial nerve injury. Approximately two weeks later a neurosurgical consultant advised that there had been some improvement in the facial nerve and suggested physical therapy in the form of stimulation.

Postoperative Program—The mandibular and cervical branches of the Seventh Nerve appeared to be functioning better on March 16. Extraorally, the submental wound appeared to have closed satisfactorily. The intraoral area of sloughing near the anterior teeth of the mandible appeared to be granulating by secondary intention.

Bony Absorption about Fracture Site—Radiographs of the mandible taken on March 28 showed considerable bony absorption about the fracture site of the symphysis (Fig. 11).

Drainage Intermittent—From April 15 to April 22 there were intermittent episodes of extraoral drainage from the submental wound. The exudate was of salivary consistency.

11. ***View taken on March 28, 1955. Note the mottling of the bone in the region of the symphysis and transosseous wires.***

Fourth Surgical Procedure

1. On April 22, under general anesthesia, the transosseous wires near the symphysis of the mandible were removed.

2. Old granulation tissue near the fracture site was excised, and the wound was closed in layers leaving a Penrose drain.

3. The patient was reprepared and the supraorbital incisions opened.

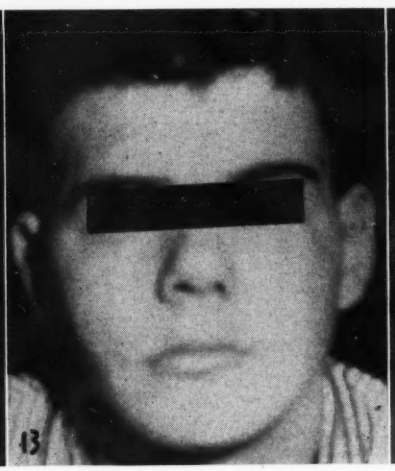
4. The wires were exposed, cut, and the wounds closed after excising the old scar tissue.

5. The suspensory wires were removed by exertion pressure from inside the mouth.

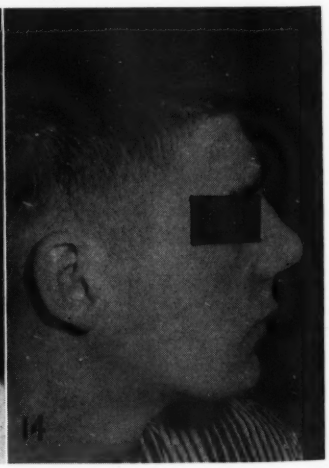
6. All wires, bars, and traction were removed. The patient left the operating room in good condition.

Drainage Persistent—The submen-

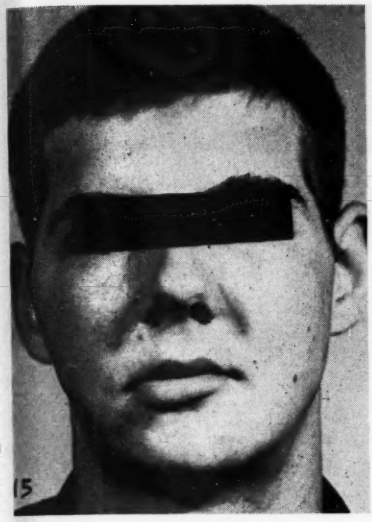
12. ***Left lateral jaw film taken May 31, 1955. There is less osteoporosis and an indication of filling in the infected bony tissue.***



13. ***Photograph taken June 3, 1955. There is poor muscle control of the right upper eyelid and right corner of the mouth. Some facial edema persists.***



14. ***Profile of patient photographed June 3, 1955.***



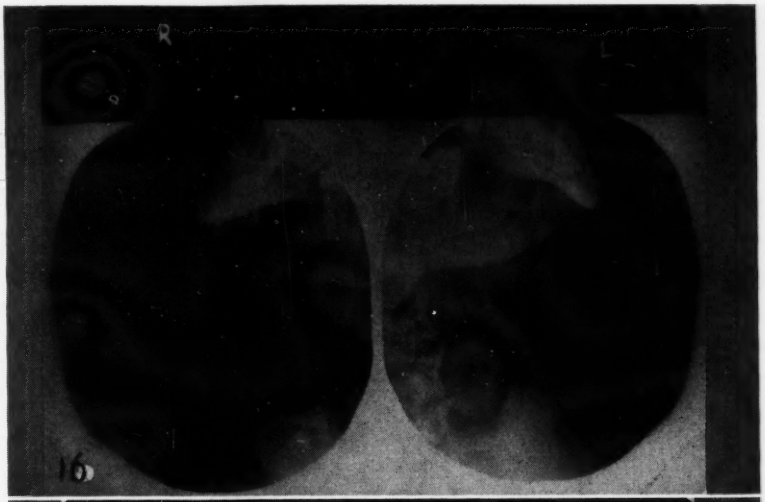
15. ***The patient was photographed August 2, 1955. The supraorbital, temporal and submental incisions are virtually invisible.***

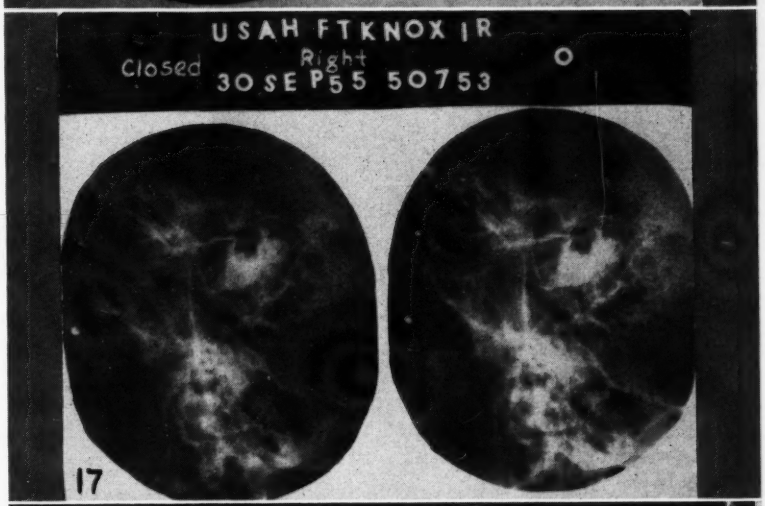
tal drainage was still persistent. Since it was salivary in nature attempts to locate a salivary-cutaneous fistula by probes and sialograms were not successful. No oral-cutaneous fistula could be demonstrated. Cultures were all negative. High dosages of atropine sulfate were administered in an effort to reduce the exudate. The drainage ceased temporarily, but began again as the atropine was discontinued.

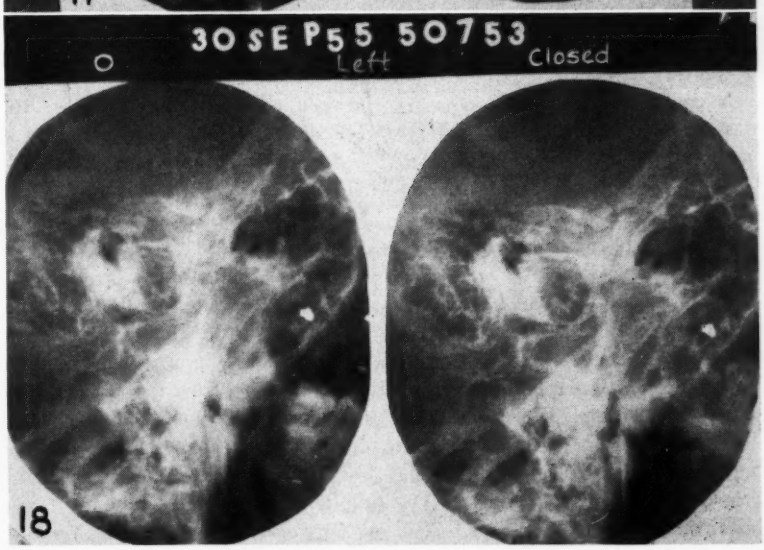
Fistula in Floor of Mouth—On May 10, a fistulas tract was found to exist between the floor of the mouth near the opening of the left Wharton's duct and lingual surface of the mandible to the skin in the submental region. The fistulous opening in the mouth became larger each day and on May 20, the patient was again brought to surgery.

Fifth Surgical Procedure

1. Under general anesthesia, careful examination of the mouth revealed the tongue adherent to the floor of the mouth.







16. ***Right and left lateral jaw films taken on September 30, 1955 show healing of the left mandible near symphysis.***

17, *and* **18.** ***Temporomandibular joint films taken on September 30, 1955, with the right and left sides in the open and closed positions. There is evidence of minimal restriction of movement bilaterally, as well as slight anterior displacement of the condyles in the closed position. The left condyle is in better position than the right condyle.***

2. A lingual frenectomy was, therefore, performed.

3. From an intraoral approach a fragment of loose bone beneath the lingual mucosa, at about the middle third of the mandible, near the symphysis, could be felt.

4. This was removed and measured 1 by 1 by 1 centimeters.

5. The fistulous tract was excised intraorally as far as the interior border of the mandible.

6. Because of the large oral defect a primary closure was impossible. A piece of rubber dam was, therefore, inserted to the level of the inferior border of the mandible along the lingual cortex. This drain was held in position with silk sutures.

7. The cutaneous fistula was completely excised, the skin undermined, and closed without tension.

8. A small thyroid drain was inserted underneath the skin closure.

The patient tolerated the procedure and was returned to his ward.

Wound Healing Uneventful — The patient was placed on chloromycetin therapy for three days postoperatively. The cutaneous drain was removed 24 hours after surgery, and on May 27, all intraoral sutures and drain were removed. The submental wound healed uneventfully (Figs. 12, 13, and 14).

19. ***View taken September 30, 1955 shows an almost complete filling-in of bone in the symphysis region. There is a slight depression in the continuity of the inferior border distal to the symphysis of the left mandible.***

Additional Surgical Measures

A small amount of bony sequestra was removed from the maxillary left molar region on July 18. An acrylic splint was prepared and inserted following this sequestrectomy, for it was felt that an oral-antral fistula would result.

2. On August 2, a small oral communication with the antrum in the region of the sequestrectomy was detected. A full face photograph was taken on this date (Fig. 15).

3. When the patient was seen on September 30, the oral-antral fistula measured approximately 1 to 1½ millimeters in circumference. Closure of the oral-antral fistula did not seem to be indicated at this time, because there appeared to be more sclerotic bone at the periphery of the fistula.

4. Postoperative radiographs taken September 30, revealed excellent healing of the middle face fractures as well as the mandible (Figs. 16, 17, 18, and 19).

Satisfactory Closure of Fistula— The patient was next examined on March 24, 1956. During the interval between September 30, 1955 and March 24, 1956, at another Army installation two attempts to close the oral-antral fistula finally resulted in a satisfactory closure. On this date (March 24, 1956) the patient had maxillary and mandibular partial dentures. Additional radiographs revealed continued healing of the mandible (Figs. 20 and 21).

Improvement in Seventh Nerve— There was significant improvement of the Seventh Nerve of the right face. Occlusion was excellent, the patient could open his mouth adequately, and make lateral and protrusive excursions with his mandible. The facial incisions were inconspicuous. The right eye could close completely.

Final Result Excellent — Photographs taken more than two years postoperatively reveal this patient's good occlusion, and ability to open his mouth. Minimal paresis of the cervical branch of the right facial nerve remains (Figs. 22, 23, and 24).

Discussion of Surgical Problem

The first and most important problem presented in this case was the establishement of an unobstructed airway. Bleeding from the facial fractures and soft tissues into the oropharnyx continually threatened the patient's airway. A tracheotomy was, therefore, performed.

Low Grade Osteomyelitis Present— Osteomyelitis following fractures of

the mandible is a rare complication since the advent of antibiotics. In this case a low grade osteomyelitis was apparently present. Radiographs of the mandible of March 11, 1955, revealed considerable bony absorption near the symphysis.

Possible Source of Infection—Since the symphysis fracture was compounded into the mouth and comminuted, organisms may have entered from the mouth at the time of the accident and set up an infectious process. If the antibiotic therapy first employed (penicillin and streptomycin) were not effective against the initial bacterial shower, it can be assumed that the osteolytic process began at the time of the accident.

First Appearance of Exudate—The patient from the time of admittance on January 25 to January 28 when he was brought to surgery for the fractured symphysis, did not exhibit a suppurative exudate. This is not unusual since it frequently is about four to seven days after an infective process begins, that a purulent exudate is seen clinically. It was four days after mandibular surgery that the suppurative exudate was first noticed, or approximately one week following the accident.

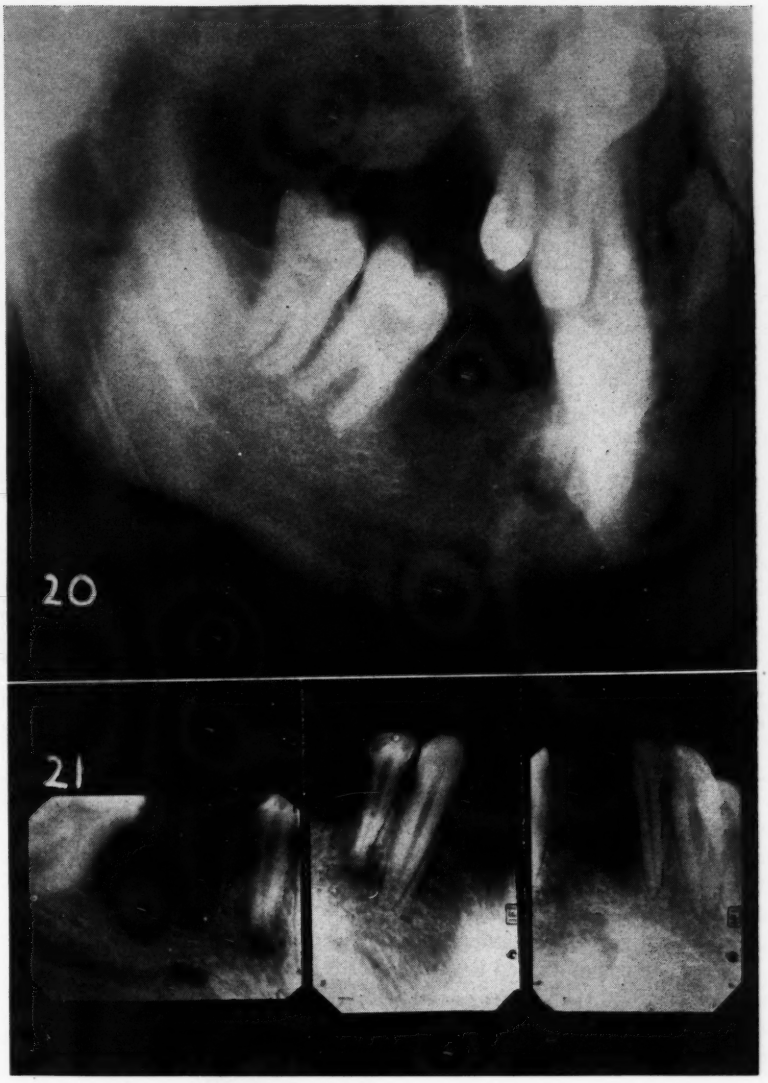
Organism Resistant to Antibiotics Used—It is significant that the smear taken for culture on February 3, 1955, revealed the dominant organism to be a hemolytic staphylococcus aureus; an organism which was found to be resistant to both penicillin and streptomycin, the antibiotics used at the time of admission.

Second Possibility—It is possible that the osteomyelitis was precipitated at the open reduction of the symphysis. The infected mandible responded to chloromycetin therapy. Radiographs of the mandible from March 11 to April 25 revealed the destructive process in bone that was seen clinically from the last of January to February 20, 1955.

Restoration of Bony Structure—When there is extensive damage to the anterior walls and floor of the antrum with the supporting teeth shattered, plans must be made for the removal of these teeth, with restoration of the bony framework. To accomplish this, it was necessary to conserve all the bone attached to the mutilated teeth when they were removed. This bone was washed in normal saline solution and inserted in the maxillae in as normal a relationship as possible. The mucoperiosteum was sutured firmly with multiple interrupted silk sutures, thereby completely closing the wound.

Maintenance of Anterior Wall and Floor—Bilateral nasal-antral windows through which packing was passed into the sinuses, helped to maintain the anterior wall and floor of the antra.

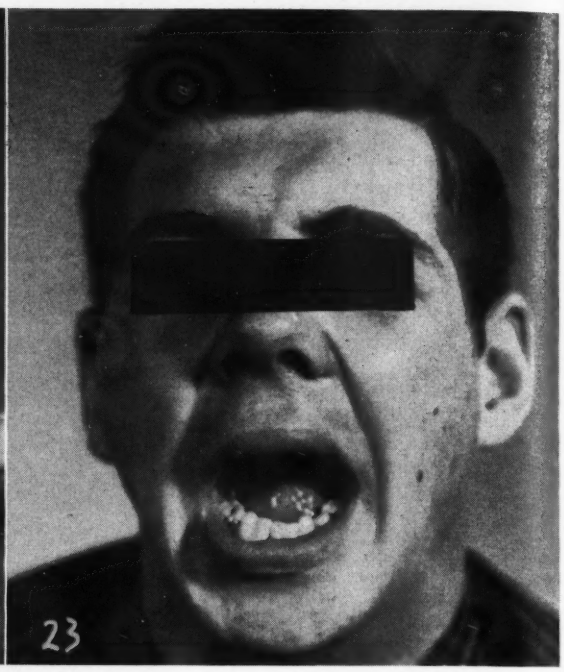
Reduction of Fractured Mandible and Middle Face Fractures—Another problem was to reduce and fix the fractured symphysis of the mandible. This was accomplished by open reduction and intermaxillary traction. The maxilla and zygomatic bones were reduced and fixed by applying



20. ***Left lateral jaw film taken March 24, 1956 demonstrates filling-in of osteoporotic areas with new bone The continuity of the inferior border is essentially normal again. Rarefaction apical to the left bicuspid is visualized.***

21. ***Intraoral films of the left mandible also taken March 24, 1956 reveal calcification and bony union of the fractured symphysis. Again detected is the periapical translucency involving the first premolar.***

22. ***Photograph taken February 24, 1957 showing occlusal relationship.***



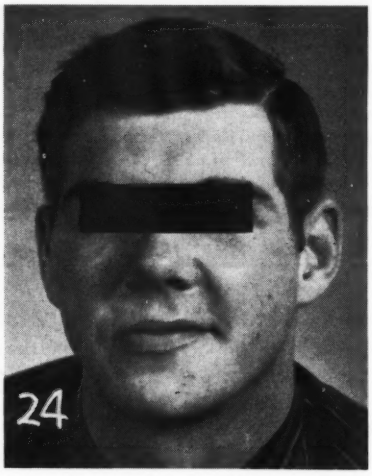
23. ***Photograph of the patient taken February 24, 1957, revealing the open mouth position obtainable at this date.***

arch bars to the upper and lower teeth and by internal wire suspension from both supraorbital rims. This type of fixation helped to immobilize the fractured zygomatic arches, symphysis of the mandible, and the fractured condyles. The depressed left zygomatic arch was reduced by an extraoral open reduction (Gillies Technique).

Treatment of Fractured Condyles—The fractured condyles were treated in a conservative manner. In fracture dislocations of the condylar head, it is believed that an adequate fibrous joint is formed in the soft tissues. If the fractured condyle does not interfere with the function of the jaws, it would seem that an open reduction is not indicated. To date, the results are gratifying as the patient is capable of adequate mandibular excursions in all directions.

Management of Cutaneous Fistula—The oral cutaneous fistula probably originated during the period immediately following the open reduction of the fractured symphysis of the mandible. The loose fragment of lingual bone lying distal to the symphysis undoubtedly prevented the oral cutaneous fistula from healing.

Observation Required after Symptoms of Facial Palsy—The facial nerve paralysis was treated as prescribed by the neurosurgeon. Physical therapy and time produced satisfactory results. Continued improvement of facial muscles is reported. Careful observation following symptoms of facial palsy is essential. When massive amounts of facial edema are present, the Seventh Nerve may appear paretic, but once the edema subsides, it should be possible to determine whether or not the initial paralysis was due to pressure from the edema or damage to the nerve itself.



24. ***Photograph of the patient February 24, 1957. There is slight paresis of the cervical branch of the facial nerve, indicated by the musculature on the right corner of the mouth. Functional and cosmetic results are excellent.***

Conclusion

The surgical procedures applied in a patient with multiple facial fractures and their complications have been presented. Treatment of fractured facial bones must always consist of adequate reduction and immobilization, plus maintenance of this desired position until healing has occurred. These basic principles were observed with the result that excellent functional and cosmetic conditions were obtained.

Hunting Towers, East Suite 131

The EDITOR'S Page

HIGH-SPEED procedures for the reduction of tooth structure are among the most significant developments in present-day dental practice. Rotary cutting instruments have been stepped up in speed by the creating of new handpieces and contra-angles. It is a far cry from the days of foot engines and the slow, painful reduction of tooth bulk.

With the higher speeds comes more friction. Friction creates heat and from heat comes injury to the instrument and discomfort to the patient. When the temperature of the instrument in the mouth rises, the patient becomes uneasy. An increased temperature of the hand of the operator is likewise unpleasant. This all sums up to mean that for the welfare of the patient, the operator, and the instrument a higher quality of attention is required than was necessary for the older type of handpieces. Cleaning, lubrication, adjustment are no longer casual and occasional procedures. They are imperative and essential.

From the University of Michigan comes a report on the subject of the care of the newer high-speed handpieces and contra-angles:[1]

Cleaning

"The gears and bearings of contra-angles and straight handpieces may become contaminated with bits of some revolving instruments, cut tooth tissue, polishing material, and fluids during use in the mouth. Cleaning immediately after use, therefore, becomes essential, otherwise abrasive wear will tend to occur more rapidly.

"Various cleaners have been advocated including carbon tetrachloride and various petroleum distillates. The carbon tetrachloride is generally not used industrially for the cleaning of precision machinery. This solvent, in the presence of moisture and light, liberates traces of hydrochloric acid which are very corrosive to metals . . .

"Carbon tetrachloride has the advantage over any of the petroleum distillates of being noninflammable, although it has a fairly high toxicity . . .

"Since moisture may be a contaminator of the handpiece and contra-angle, and since neither the petroleum nor chlorinated solvents used are miscible with this moisture, difficulty might arise in obtaining suitable cleanliness of the instruments. It appears possible that some of this moisture, along with other contaminators, might be trapped in bearing crevices or between gear teeth. This trapped material would become an undesirable residue. Thus, some method of dispelling this moisture and any suspended particulate matter would seem high desirable."

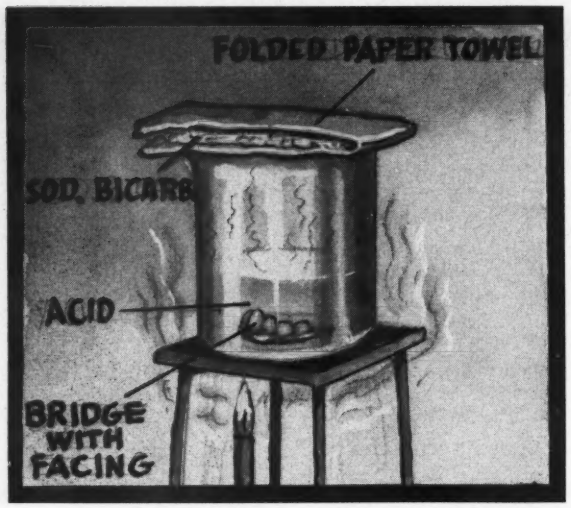
Lubrication

"It was observed that when a handpiece was placed into a sterilizing fluid and the excess oil drained off leaving the residual oil as the lubricant, the temperature rise of the bearings was somewhat greater than when the cleaned handpiece was lightly lubricated with an applicator. The greater the amount of residual oil removed from the handpiece, the less the temperature rise of the bearings. This occurrence might substantiate the common thought that excess lubrication is detrimental. Difficulties resulting from overlubrication far outweigh those arising from underlubrication; excessive heat generation, rapid deterioration of the lubricant and leakage from the instrument will result. Since viscosity is a measure of a lubricant's internal friction, it would appear that the more viscous a lubricant and the greater the amount of lubricant, the more shear forces would occur between the molecules of the fluid. Thus, a greater quantity of heat would be given off."

Adjustment

"The belt tension is quite critical and influences both speed of the handpiece and temperature rise over the bearings." *Speed decreased and temperature increased when the belt tension was increased.*

[1]Charbeneau, G. T., and Peyton, F. A.: Evaluation of Lubricants for Dental Handpieces and Contra-Angles, J. Dent. Research **36**:479 (June) 1957.



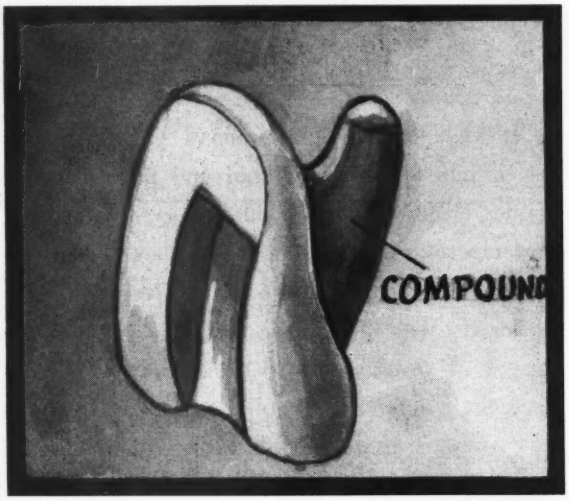
1

Clinical and Laborator

Neutralizing Acid Fumes

J. E. Wilson, D.D.S., North Hollywood, California

1. Moisten a paper towel. Sprinkle sodium bicarbonate on the towel and fold. Place the folded towel on the beaker in which a bridge is being boiled in acid to remove the facings.

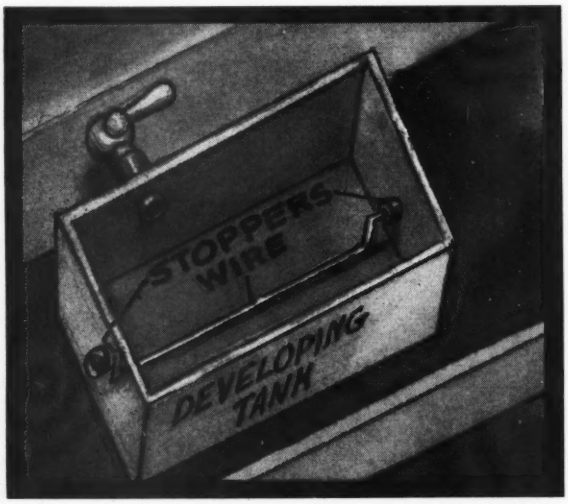


2

Accurate Mounting of a Casting in Alginate

Walter C. Harbart, D.D.S., Los Angeles

2. A knob of modeling compound attached to a three-quarter casting will assure that the casting is locked in the proper position in an alginate impression.



3

Stoppers for a Developing Tank

J. A. Rushing, D.D.S., Malvern, Arkansas

3. To prevent dislodgement of the rubber stoppers in the x-ray processing tank bend a piece of copper or aluminum wire to run along the bottom of the tank. Each stopper is antagonistic to the other.

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Frank Lee, D.D.S., Portland, Oregon

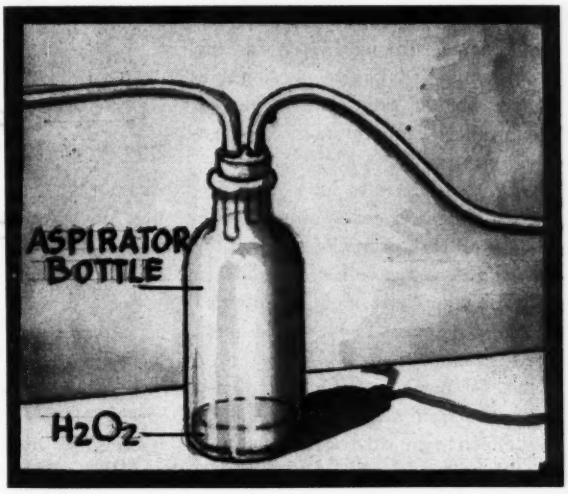
4. Express one cubic centimeter of anesthetic solution into a sterile dappen dish. This sterile solution may be used as a swab to clean the base of a cavity preparation.

4

Preventing Clotted Blood from Clogging Aspirator

Donald D. Fleckenstein, D.D.S., Colby, Kansas

5. In order to facilitate cleaning the tube and bottle of an aspirator place a small amount of hydrogen peroxide in the aspirator before use.

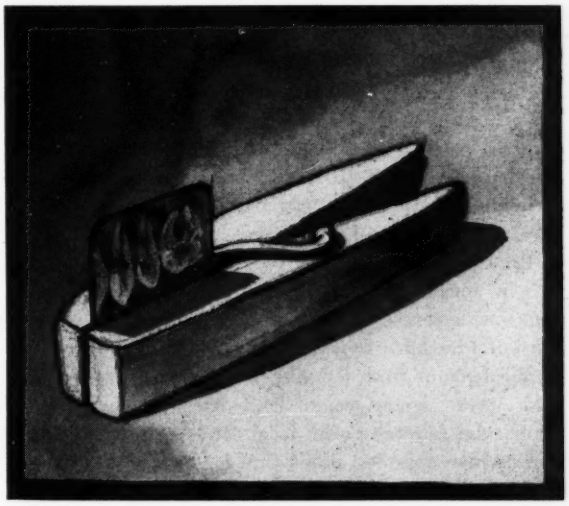


5

A Holder for X-ray Film

Rosalie Carter, D.D.S., Franklin, Tennessee

6. A clean one-cent clothes pin makes an excellent holder for a wet or dry film. The pin has a strong clamp and holds the film upright on the bracket table.



6

technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time. Turn to page 400 for a convenient form to use.

Send your ideas to Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

MEDICINE and the Biologic Sciences

Hypertension—Recent Developments

From the clinical standpoint no major advances in our understanding of etiology or pathogenesis of hypertension have appeared recently. There is a small group who feel that high blood pressure is not a disease but a graded individual characteristic conditioned by heredity and environment. Death from this condition is the result of the vascular damage which unusually high and sustained blood pressure engenders in the person so unfortunate as to carry blood pressure levels higher than the average.

Sustained high blood pressure does induce vascular disease. A reduction in blood pressure, by whatever means, will prolong life. The prognosis varies widely but in general parallels the magnitude of the vascular complications.

There continues to be wide differences of opinion concerning the usefulness of various regimens. For the milder cases, rauwolfia alkaloids in properly applied and maintained dosage are agreed to lower the blood pressure more than 20 millimeters in about 50 per cent of cases. Sometimes the results are dramatic. It is less effective in cardiac disease and should be used only in conjunction with other more potent agents when the accelerated or malignant form is being treated. Depression states are the only serious side effects of rauwolfia therapy, but this reaction is fortunately rare.

Sympathectomy has lost favor in most clinics. Still, statistics indicate it is the only form of therapy which, when successful in reducing blood pressure, is known to prolong survival in all forms of the disease.

Prompt blood pressure reduction is now considered mandatory in patients with severe degrees of hypertension who have hypertension with papilledema or fresh retinal exudates, and severe hypertension with left ventricular failure or with focal cerebravascular episodes either transient or with minor residuals. Such reduction is properly advisable when the blood pressure is equally high in a young person even before a vascular lesion has developed.

Some drugs have been introduced as ganglionic blocking agents. They should be used only when it is decided that they are necessary for the prolongation of life. The most effective regimen must be promptly started and the effect monitored constantly by the physician and the patient, preferably by instructing the patient in the taking of his own blood pressure and in controlling the daily dosage accordingly. As a result the life of the patient with malignant hypertension may be prolonged many years.

Sturgis, Cyrus C., et. al.: Advances in Internal Medicine, J. Michigan M. Soc. **55**:154-161 (February) 1956.

Diabetes—Trauma

An existing diabetes may be influenced by external forces or trauma. The trauma may be physical or psychic, sudden or gradual, temporary or prolonged, mild or severe. It may be direct or indirect, causing physical damage or interfering with function.

In existing diabetes, trauma can cause an accentuation of the disease. Ordinarily this is of temporary duration unless there has been direct damage to the pancreas severe enough to destroy a major part of its insulin productivity. Ordinary trauma to that portion of the brain carrying impulses to the pituitary or to the sympathetic nervous system stimulating the adrenal gland may disturb the existing balance. The derangement is only temporary, however. Psychic trauma severe enough to induce a stress reaction with the liberation of cortisone from the adrenal gland may aggravate an existing diabetes.

Fractures, burns, or concussions—in fact most injuries severe enough to confine the patient to his bed may aggravate the diabetes directly by shaking the endocrine tree, or indirectly through lack of exercise, change in diet, or secondary infection.

The change in the disease usually appears immediately after the accident and has an average duration of 26 days. Seldom is there any later aggravation of the disease. Unless there is severe damage to the pancreas or the brain in the vicinity of the pituitary gland, the course of the diabetes is generally not seriously altered.

It is believed that trauma may indirectly activate a tendency to diabetes. Trauma may advance the date of onset of diabetes in an hereditarily disposed person who was predestined to become diabetic at a given age. In the presence of obesity, infection, disease of the liver, forced muscular inactivity, or a permanent lesion of the pituitary, thyroid, or adrenal gland, trauma may appreciably hasten the appearance of diabetes.

Trauma is virtually never the cause of diabetes. Simple physical injury in athletics has never been known to cause diabetes. Indirectly trauma might cause diabetes if it could initiate processes leading to the destruction or inactivation of something like nine-tenths of the insulin-pro-

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ducing tissue of the pancreas. This seldom happens as a result of disease and is a remote possibility as a sequela to infection involving the pancreas.

Reveno, W. S.: Trauma and Diabetes, Postgrad. Med. **19**:36-43 (January) 1956.

Children's Shoes

Children's feet should receive the same attention that is given other pediatric problems. It should be the pediatrician's responsibility to render advice based upon examination and diagnosis. Too often shoe manufacturers influence not only the laity but also the professional men with the advertisements of "proper shoes."

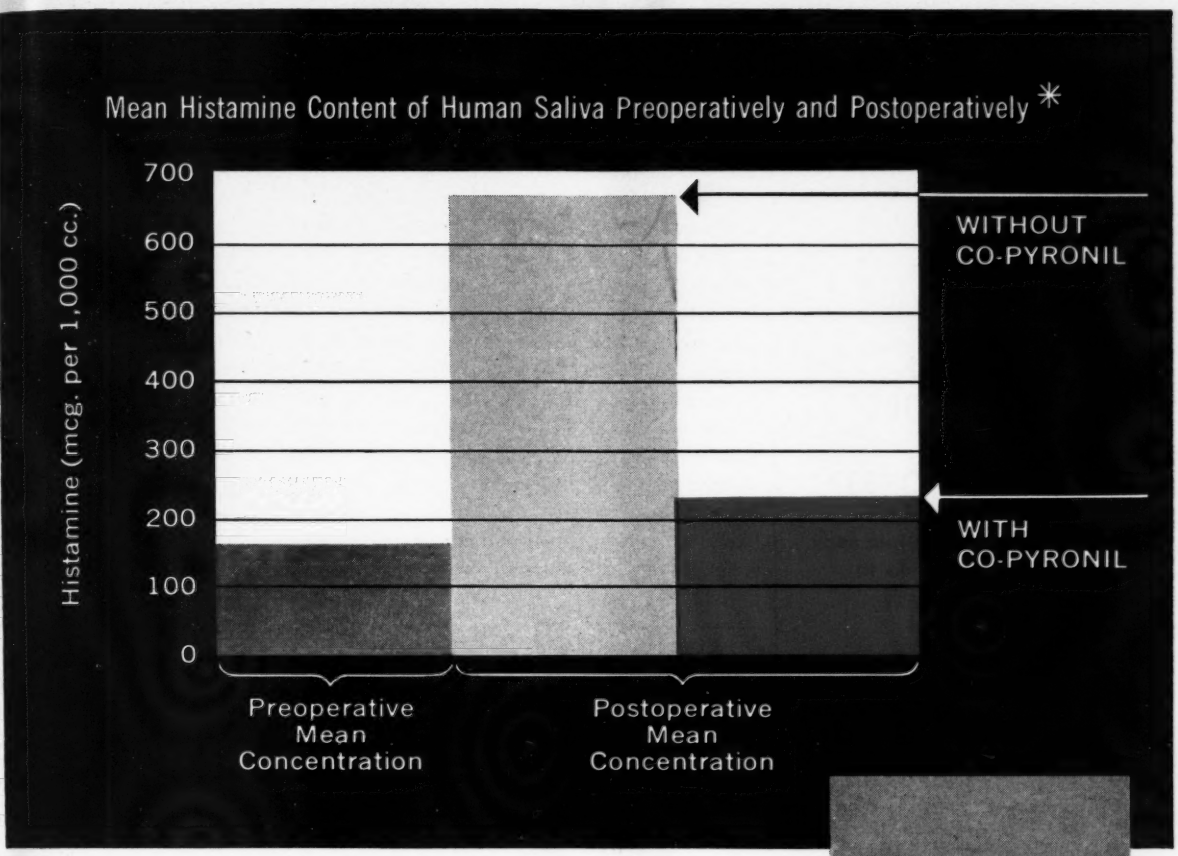
Examination of the feet at birth and again when the child walks is important. Cognizance of the ordinary foot problems in children is necessary if professional treatment is to supplant pressure salesmanship.

The normal foot has a good longitudinal arch without pronation. The forefoot is well alined on the hindfoot. The toes are well placed and straight and lie flat. The ankles do not bulge internally or externally. The foot is straight forward and properly alined on the leg.

In general, solid leather shoes of the blucher type with the lace across the tongue are suitable for children. The soles should be thick and inflexible. Booties and soft sole shoes should never be worn.

Shoe fitting is not difficult. A shoe one thumb-breadth longer and one little fingerbreadth wider than the foot is recommended. Fluoroscopic examination is not necessary and may be hazardous if exposure time is uncontrolled.

If a foot defect exists, specific treatment is prescribed. Wedges are of value only when applied accurately to solid leather shoes with thick soles. The inserts are made on the outside between the soles and within the substance of the heels. This position protects the wedges from wear and



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*Adapted from J. Oral Surg., *13*:193, 1955.

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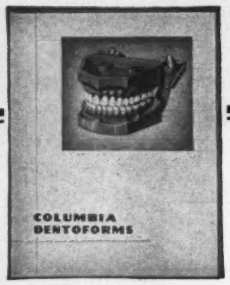

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heels and soles can be repaired as needed. The wedges should vary in width from 1/8 to 3/16 inches, depending upon the age of the child and the degree of deformity.

Inner heel and inner sole wedges are required for extreme relaxation of the longitudinal arches in talipes calcaneovalgus. An outer sole wedge is used for the postural type of metatarsus varus and an inner sole wedge for the postural type of external rotation deformity.

The definition "orthopedic shoes" should be discarded. No single type of shoe is applicable for all defects. More damage than correction is likely to result if the panacean prescription of the manufacturer is followed.

Liebolt, Frederick Lee: Shoes for Children, Pediat. Clin. North America (November) 1955, pages 1003-1007.

Cancer of the Colon

The colon is the site of seven per cent of all malignant neoplasms affecting the human body. About 95 per cent of all tumors involving the intestinal tract are found in the colon. Between 30,000 to 35,000 American people die annually from cancer of the colon and rectum.

If the condition is diagnosed early and treated by appropriate surgical operation, it offers better opportunity for cure than any other type of internal malignant growth. Still, greater emphasis must be applied to early diagnosis of cancer of the colon and its precursory lesions.

The symptomatology of cancer of the colon is vague. There are no symptoms, nor is there a group of symptoms that can be designated as pathognomonic for early malignant disease of the colon. There may be occasional minor digestive disturbances to which the patient attaches little or no significance. Symptoms are not apparent until the disease is well established and then only because of (1) ulceration, 2) secondary infection, (3) obstruction, (4) perforation, and (5) fistula.

Pain is usually intermittent and is cramping in nature. Often it is a dull ache occurring without reference to bowel action or the taking of food. All cancers of the colon are eventually complicated by ulceration and infection. This fact is probably responsible for the earliest symptoms of most cases.

As ulceration progresses, changes in bowel habits supervene with increasing severity. These vary from mild looseness of the stool or constipation to full-blown diarrhea or stubborn constipation.

Toxemia or anemia or both are frequently accompaniments of large ulcerating lesions of the right portion of the colon and may be the only symptoms. Right and left colonic tumors differ in their clinical manifestations because of their marked difference in embryogenic development, anatomy and function.

Every patient more than the age of 40 years who undergoes routine physical examination should submit to proctosigmoidoscopic examination and roentgenologic inspection of his colon. Twelve per cent of all persons harbor lesions of malignant potentialities in their rectum and colons at some time in their lives.

Mayo, Charles W., and Davis, Donald R.: Neoplasms of the Colon, Postgrad. Med. **17**:453-459 (June) 1955.

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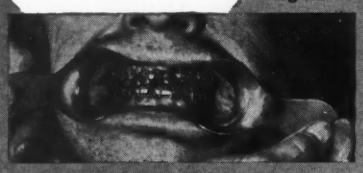

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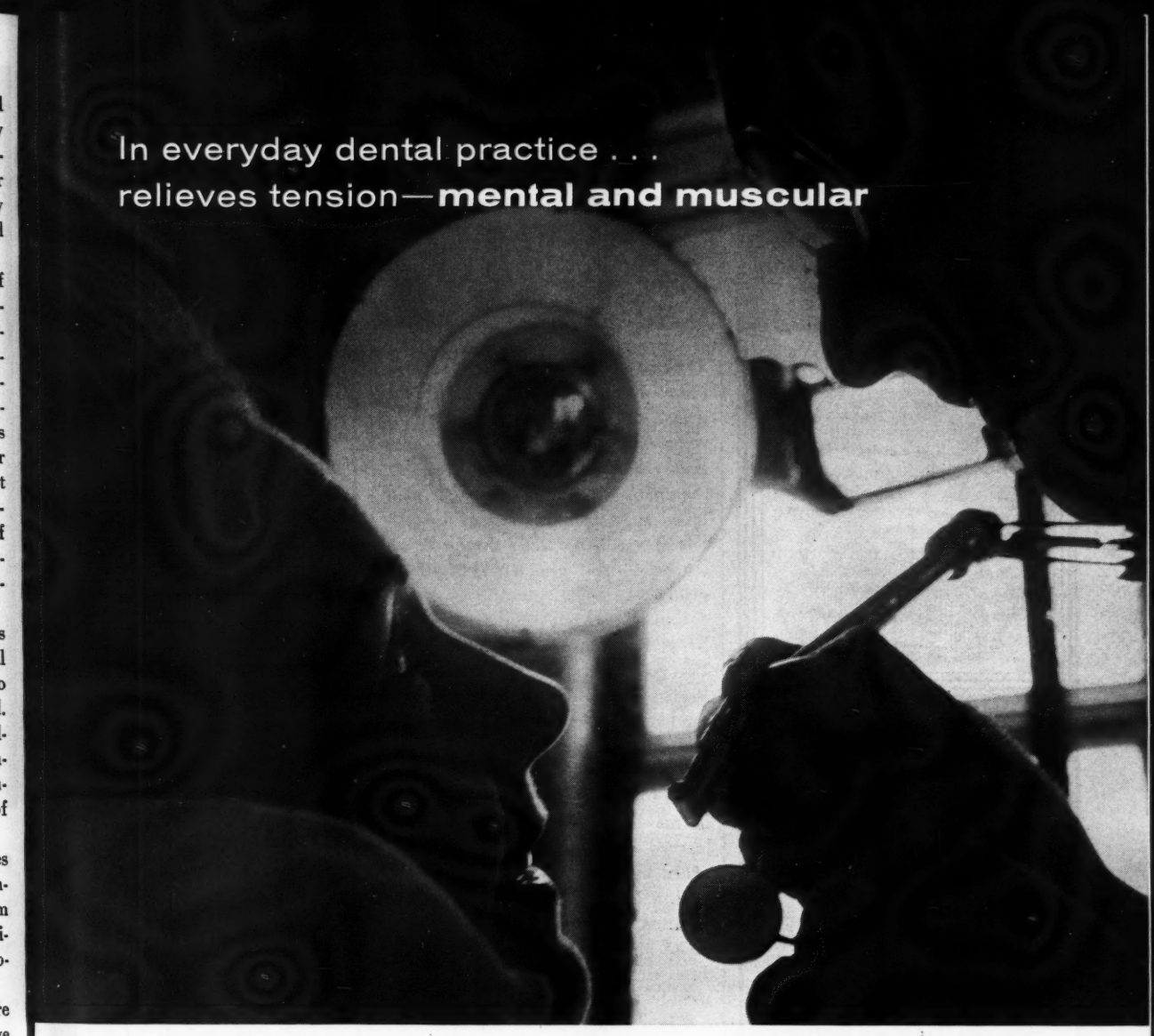

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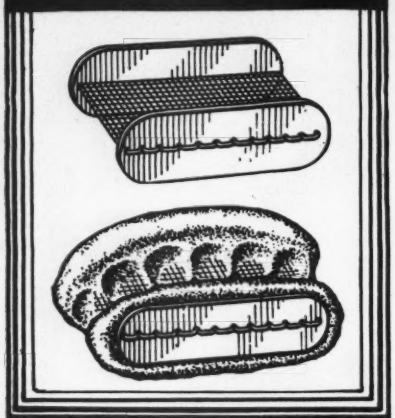

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Moping in the Sun

Many people are impressed with the drama of scientific research. In their romantizing they picture the peerers into electron microscopes, the star searchers, the splitters of atoms as a breed apart from the rest of us mortals. There is certainly drama in research — and also a full share of drudgery.

Can one set out to be a researcher by giving himself the order: "Now I'm going to discover something"? Probably not. An uninspired person can likely conduct a research program and accumulate an armload of equations and graphs but he may never make an important discovery although he may have read a paper before a learned society and have had it published in a scientific journal.

How do you suppose a first-rate scientist, a Nobel prize-winner, goes about his work? *Scope Weekly* for 5 June gives this account of the method used by the illustrious Szent-Gyŏrgyi:

"The ideal method for scientific thought, he feels, is not to interfere with the work of the subconscious. Let it do the thinking, he says, and if your mind is well stocked and your preparation sufficient, it will come up with a solution while you are apparently idling the time away in fishing.

" 'Life at Woods Hole is quiet,' Doctor Szent-Gyŏrgyi says. 'Here by the sea the brain does a great deal of work unconsciously when we don't meddle with it. If we hustle-bustle all the time the brain can't do its important work. I think when I fish, when I swim, when I walk.

" 'I think in the evening when I watch the sea and listen to Bach on my long-player. The sea has a great influence on my thinking. It is so enormous one can't think petty thoughts. In the city ideas shrink. Here by the sea they spread and grow.' "

Now that the days of relaxation should be still at hand, dentists should be cheered by these words of Doctor Szent-Gyŏrgyi. Who knows that you may not be on the verge of a great discovery as you mope in the Autumn sun?

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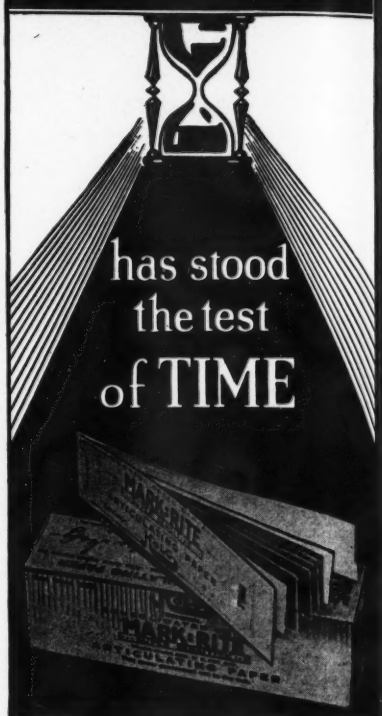

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Too Much Interest in Diet: Too Little in Nutrition

If you happened to be looking at *Coronet* for July you might have been startled to see a sticker on the cover announcing "Stop Tooth Decay. New Diet Prevents Cavities." Perhaps you felt that you had been inattentive to the dental literature and that some important discovery had been made while you were looking the other way. Cheer up. Nothing important happened while your back was turned.

The "new diet that prevents cavities" is the old one that eliminates or restricts refined sugar from the diet. Nothing new about that!

Cutting down on refined sugar does improve the resistance of the teeth to caries. It does not prevent the disease. Anything that prevents disease eliminates it altogether. A reduction in the incidence of any disease is a control measure, it is not prevention. We have been guilty of using the word *prevention* too loosely.

To give the public the idea that they can prevent caries by reducing the consumption of sugar is to spread a half-truth. We are on safe ground if we say that the restriction or elimination of sugar will make a significant improvement in the health of the dental hard tissues and in the general well-being. (The new Code of Ethics of the American Medical Association, by the way, mentions the *well-being* of the patient as a primary concern in the practice of medicine. The word *welfare* was stricken from the Code because it had an unpleasant social connotation. Semantics in action!)

This special diet "that saves teeth," as featured in *Coronet*, is heavy in fat. The consumption of one cup of whipping cream a day is recommended. That represents 800 calories and 80 grams of fat. With the present emphasis on the relationship between atherosclerosis, cholesterol, and lipid metabolism on disease of the arteries it is dangerous to tell people to take more fat to save their teeth if by so doing their circulatory mechanism is endangered. If a person must choose between disease of the teeth and disease of the arteries he is foolish to prefer freedom from tooth decay. Dental caries is one disease that can be corrected successfully by mechanical methods. So far no one has constructed a new set of coronary or cerebral arteries.

Except to the family dairy bill no great harm might come to young people by drinking a cup of whipping cream a day. There is, however, the real danger of obesity from acquiring 800 calories and 80 grams of fat in one cup of anything. (One cup of *whole milk* supplies 165 calories, 10 grams of fat. One cup of *skimmed milk* equals 85 calories, a trace of fat). There is also the danger in the cup of whipping cream a day diet that an evil food habit will be acquired that will do eventual harm to the arteries.

There should be no such thing as a diet for one specific tissue. The emphasis must be on optimum nutrition for the entire organism. The irony is that people will accept diet fads but are generally unconcerned with fundamental nutrition. Women will storm the newsstands to buy a magazine that features an article "The

Advertisement

Experience with New Posterior Teeth Confirms Research Findings

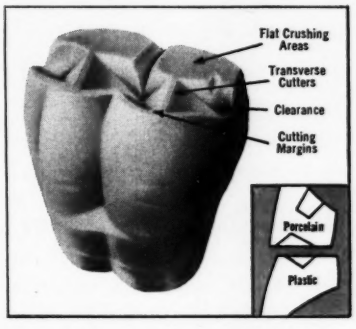
MYERSON AND SEARS DESIGN AND COMBINATION OF MATERIALS PROVE BENEFICIAL IN FULL RANGE OF CASES

Review

February 1956, Richard L. Myerson reported to the American Academy for Plastic Research in Dentistry his finding of dramatic reduction in wear of plastic teeth when opposed to properly designed porcelain teeth. November 1956, Victor H. Sears and Simon Myerson reported remarkable success in forty-eight clinical test cases. At the time of this writing, thousands of full dentures have been made with Myerson and Sears porcelain-plastic posterior teeth by the profession-at-large. There can be no doubt that this use has been extensive enough to be highly conclusive.

Results

Success has been reported on the most difficult as well as on normal cases. Equally important, no single case of failure or disappointment has been reported either voluntarily or upon solicitation.



Details of occlusal construction of new Myerson and Sears posterior teeth. Insert drawing shows how upper and lower teeth meet in one plane.

Conclusion

Many benefits can be derived from the use of Myerson and Sears posterior teeth. They are listed below.

I Benefits of Opposing Porcelain Teeth to Plastic

1. One tenth the loss due to wear compared to that experienced when opposing plastic teeth to plastic.
2. Less shock and resultant trauma and "clicking" than porcelain-to-porcelain.
3. Easier adaptation and adjustment due to lower teeth being plastic.
4. Increased masticating efficiency due to maintenance of sharpness by the upper teeth which are porcelain.

II Benefits of the Myerson and Sears Occlusal Design

1. Fulfilling the requirements essential to success in opposing porcelain to plastic.
2. Increased stability by directing the vertical force of mastication mainly to the lingual side.
3. Increased stability by directing most of the vertical force of mastication to the second bicuspid — first molar region.
4. Increased stability by absence of interdigitating cusps.
5. Easy set-up and articulation.

Whenever the above benefits are desired, the use of these new posterior teeth is indicated.

Available literature includes a booklet describing the new development, a technique by Dr. Victor H. Sears, and mould charts. Inquiries are welcomed. Address: MYERSON TOOTH CORPORATION, 91 Hamilton Street, Cambridge 39, Mass.

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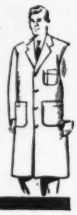

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Diet that Makes You Lovely Twenty-four Hours a Day." Men will secretly pounce on anything labeled "Dietwise for the Vigorous Man." Both of these diets carry sex overtones that I am incompetent to assess. Try to tell either men or women the general facts of nutrition and you will receive a wide yawn for your efforts. People are obsessed with the notion of special diets and indifferent to basic nutrition.

Here is the way the anthropologist, M. F. Ashley Montagu, states that view:

"Because the problem of nutrition is largely a cultural one, the approach to its solution must be principally through cultural means. But what is the problem of nutrition which we are concerned to solve? It is, surely, how one can get human beings to eat foods which at every stage of their growth and development are those most likely to contribute to their optimum health . . . No matter how complete our knowledge of the biochemistry, the physiology, and the nutritional value of food may be, unless we attend to the sociopsychologic or cultural factors first we are not likely to succeed in our endeavors."

Influenza—1918 and 1957

In the autumn of 1918, as a young lad, I spent a short and unheroic period in the U. S. Army. I neither saw nor heard any signs of enemy action in my safe position thousands of miles away from the battlefields of France. I did, however, see death at first-hand, but not from the wounds of warfare. These deaths were from the unknown submicroscopic invaders of the influenza virus and the subsequent overwhelming visitations of the several bacterial forms of pneumonia.

The Cook County Morgue, across the street from our drill field, was filled with dead. The bodies were laid out on the floors and in the corridors. The black wagons of the undertakers lined the streets ready to accept the dead. Our barracks were in an auditorium that belonged to some trade union; a place ill designed for hygienic living.

Death seemed to select the most

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robust young men in our military company of 500. It was a true plague. Young men who were apparently well and hearty were stricken suddenly and many died within a few hours or days. Their cots were empty. We never saw them again. This same horror was enacted in most of the other military camps throughout the country and in France.

No one who lived through this kind of devastation will look upon a threatened influenza epidemic as anything except a plague, akin to the Black Death of the Middle Ages.

There is no reason to create a panic now. That would be deplorable. Neither is there cause why we should not look at the implications of the present influenza threat.

The American Medical Association has created a special commission to study the present situation. The medical literature is carrying guarded articles. The country generally is not aware of the threat—or prepared to meet it.

The best article that I have seen appeared in the August number of *Harper's Magazine*. It was written by David D. Ruthstein, M.D., Professor and Head of the Department of Preventive Medicine at Harvard.

Doctor Ruthstein is no fear-monger. He is a highly respected physician who expresses himself in a direct manner. Here are some of his conclusions:

—At the moment no one can predict how serious the epidemic may be.

—In 1918 the epidemic came in two waves. The first was mild. The second wave in the late autumn was serious and in the affected communities in the United States 25 per cent to 40 per cent of the population was stricken. The death totals numbered 300,000 in the United States alone.

—The cause of the 1918 epidemic is still unknown. It is supposed that a virus was concerned.

—A virus has an evil way of mutating and changing character. We may have developed an immunity to one group of virus. When that particular virus mutates or another comes along we have no immunity to the attack.

—The secondary invaders that caused the fatal pneumonia in the 1918 epidemic were the staphylococcus, the streptococcus, and the pneumococcus. There was no specific method to destroy these invaders in 1918. Today, with the wide-spectrum antibiotics, we are more fortunate.

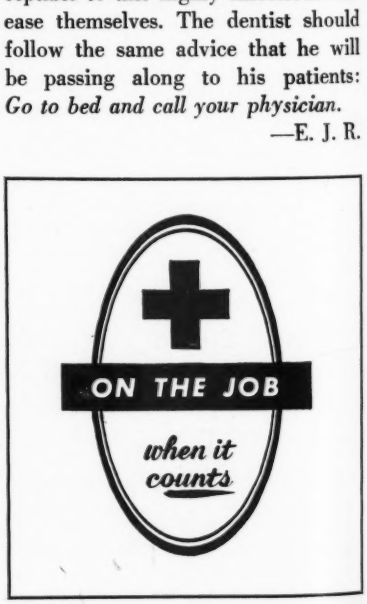
—Vaccine for the 1957 strain of the influenza virus is now being rushed in manufacture. It is unlikely that enough will be available for the entire population. Priorities for its distribution will probably be established.

—Doctor Ruthstein describes the symptoms of the disease and tells us what we should do: "If we develop chills or a chilly sensation, followed by high fever and associated with marked prostration, cough, or bloody sputum, we should go to bed immediately and call our physician. Going to bed will prevent spread of influenza to others. It will also prevent the patient from catching pneumonia-producing germs from others."

—On a brighter note Doctor Ruthstein sums up:

"Even if the 1957 epidemic of influenza should prove to be serious, the outlook is much more hopeful than it was in 1918-19. We now have many medical aids which were not available then. The new antibiotics should prevent many deaths from pneumonia, even those seriously ill. Influenza vaccine, even in very limited supply, will prevent cases of influenza among those in essential occupations or in those most susceptible to the disease. Finally, more full-time health departments, better organization of community services, and local civil-defense units should make these medical advances available to all who need them. Our job is to use all these assets effectively."

Dentists are in a favorable position to pass along information to their patients on what they should do if influenza strikes: *Go to bed and call your physician.*

Dentists are also in the unfavorable position of being in person-to-person contact with people and are thus susceptible to this highly infectious disease themselves. The dentist should follow the same advice that he will be passing along to his patients: *Go to bed and call your physician.*

—E. J. R.